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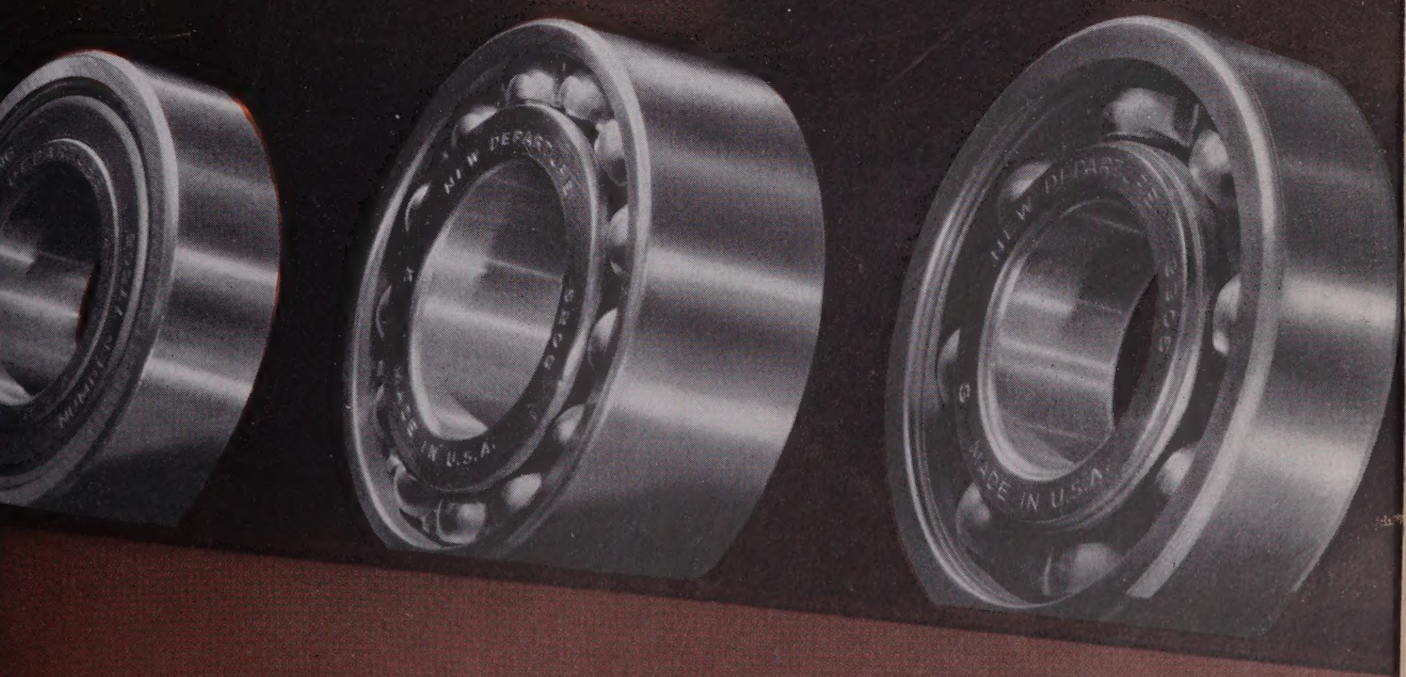
The IRON AGE

JUNE 10, 1948

Dedicated to making American-built equipment of every kind work faster, produce better, last longer.



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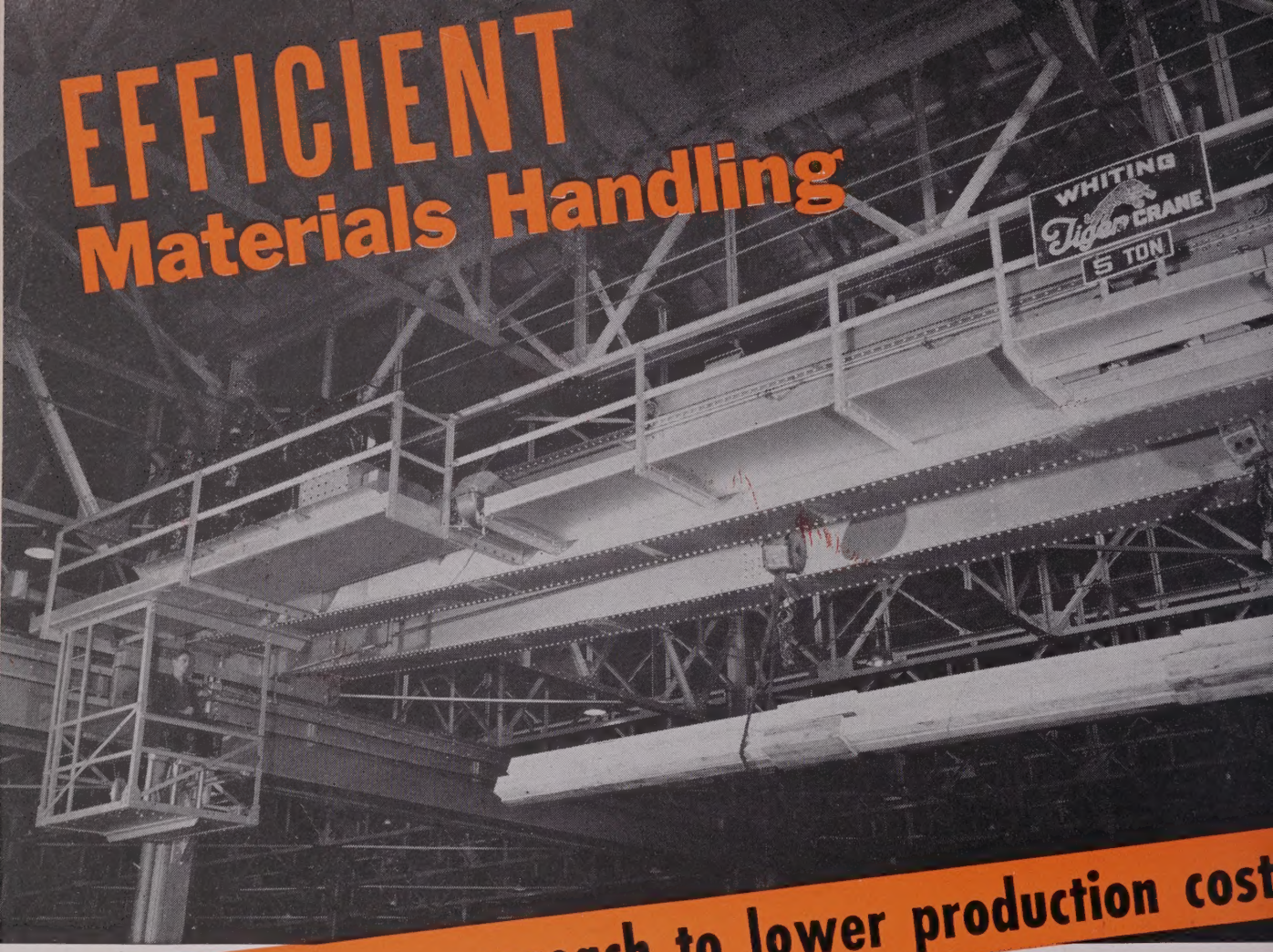

EFFICIENT Materials Handling

. . . the surest approach to lower production cost

Analysis of shop operations in a wide variety of manufacturing plants indicates that nearly half of all activity is concerned with the handling of materials. Hence, the adoption of more efficient materials-handling methods offers great opportunities for economy.

Whiting Overhead Traveling Cranes are able to operate without sacrifice of floor space . . . moving their loads above the working level spotting them accurately wherever desired.

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Want a lift, Neighbor?

If you use steel or steel products, we're going our way. Do you have a tough forging problem? Are you looking for a supply source for an intricate stamping? Do you have exacting specifications for a special casting? Do you need assistance on a problem in steel fabrication?

The cumulative skill of all Barium personnel is brought to bear upon your problems when you buy Barium products.

We are a corporate neighborhood with a common interest in steel . . . all working together to produce the best possible steel and steel products for you.

Get acquainted with the Barium subsidiary which can best advise you on your problems and supply your needs.

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OF THE 16 BARIUM GOOD NEIGHBORS

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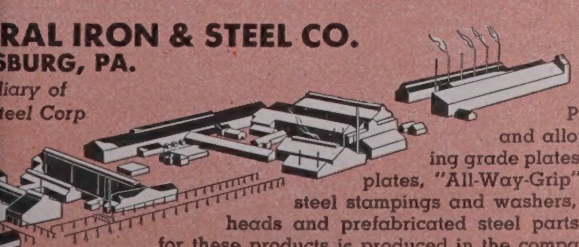

Producers of carbon and alloy steel plates, forging grade plates, boiler and fire-box plates, "All-Way-Grip" steel floor plates, steel stampings and washers, flange and dished heads and prefabricated steel parts. High-grade steel for these products is produced in the company's own furnaces

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- Tells how you can save from 10¢ to 20¢ a pound on high speed steels and get better results!
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Fatigue Cracks

BY C. T. POST

Atomized Microgems

• • *Add items that never got printed:* It woudn't be your favorite family journal unless the editors who offer full course dinners of metalworking wisdom were a little jealous of the Anonymous Brain who dispenses capsules of general omniscience in the Newsfront department, several pages due west of here. The Anonymous Brain's formula is stirred up in the dead of night. No one seems to know much about it except that it contains ten parts typewriter type with a liberal sprinkling of underlines. Whatever's in the Newsfront tablets, they beat both Fletcher's Castoria and Lydia Pinkham's compound. Young and old of both sexes cry for them. It was inevitable that some green-eyed editor should attempt to slip the following dose of arsenic in last week's Newsfront hopper when no one was looking:

> *"A new discovery in the field of electrocentric thermocrons is reported to have revolutionized the mechanism's functions to the extent that operations have been speeded 821 pct. In the new design, influx of the hydrophistic centron is actuated by the cross arm of the sustantinator so that the flow is reversed whenever the work head is floated into the secondary chamber of the spliner. This, of course, permits faster action of the thermocron and aids lubrication."*

Fortunately, the Anonymous Brain's reject lever hesitated only a moment before tossing the item in the circular file under the desk. The A.B. knew that every oil salesman in the country would spot the word "lubrication" immediately, and would flood your f.f.j. with requests for further information.

Add Aptronyms

• • Admitted to the roster of corporate aptronyms is the Fairey Aviation Co. of Middlesex, England, whose fuselages undoubtedly sprout their own wings. The Britishers have a wonderful sense of the fitness of things, using the name Fairey for an aircraft concern. The dullard Americans could do no better with a similar name than tag it to hand soap.

That Smell

• • Chicago's Armour Research Foundation, which is always popping up with new things to aid humanity, has unveiled a discovery that is going to save our chemist friends a lot of embarrassment when buying peace offerings at the perfume counter. Being a man of words rather than deeds, we've always rather enjoyed discussing the relative merits of "Nuit d'Amour", "Passion", and even "Ecstasy" with the chick that sells the stuff. But the chemists, tend to take things literally. Those of advancing years, particularly, hesitate to commit themselves on this sort of thing.

Now, according to Armour, synthetic scents can be compounded from silicon. Researchers have been successful in obtaining aromatic silicon compounds which parallel the delightful odors formerly synthesized from the benzine ring of carbon. The full name of the smelly siloxane ring is hexamethylcyclotrisiloxane. There is a little more lab work to be done, plus the matter of getting the name on the labels of those driblet-sized bottles. Then, the chemists will be able to step up to the perfume clerk with assurance and order a dram of Hexamethylcyclotrisiloxane No. 5. The chemists will like that. To us, it doesn't sound like near as much fun as what we have now.

Ready, Aim, Fire

• • The N.R.A. Blue Eagle, whose battered remains we thought we'd found between two gin mills on "L" St. in Washington, may be one with the dodo after all. We have a communication on official Form 17 (Memorandum-Inter-Office use only) of the National Recovery Administration. Signed by the "Ghost Assistant to the Administrator", it states that ". . . we, hereafter, do go on record that the premises in question were occupied by the National Rifle Association and, with finality, do affirm that our present haunts are spiritually located in sub-basement No. 1313 of the National Archives. R.I.P."

That sounds convincing. But where did that official stationary come from after 15 years, how much more is left, and what is it being saved for? Maybe, that egg the old bird layed has hatched. Keep your codes loaded, men.

Dog's Life

• • Our Hooeywood correspondent sends a clipping reporting that one Selene Walters, 22, film actress and model, has filed suit for divorce for the third time in two years against Dr. Alfred G. Huengardt, exactly twice that age. The last time they made up, it was attributed to their desire to make a proper home for their French poodle, Breezy. But here they are again, these dog lovers, as far apart as the poles.

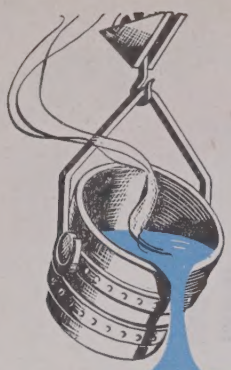
Tough Bolts for Rugged Work

These big, rugged bolts for heavy tractors, earth-moving equipment and heavy machinery are the "work horses" that handle unusually tough fastening jobs. Made from high carbon or alloy steel, with special heat-treatment, these bolts, when tightened, have extremely high resistance to stress, shear, fatigue and impact to prevent wear or breakage. They are made to perform hard tasks.

For special fastening jobs, "National" has designed and produced many special headed and threaded fasteners by the upset, cold headed process that have proved stronger and lowered costs. With its wide variety of manufacturing equipment used to make the most complete line of bolts, nuts, screws and other fasteners, "National" has the facilities to supply you with the right fasteners (large and small, standard or special) to make the products you manufacture fit better—stay tighter—or operate more smoothly.

National
PRODUCTS

HE NATIONAL SCREW & MFG. COMPANY, CLEVELAND 4, OHIO



18-8

it *will* save your money
it *may* save a product
it *has* saved a life

NO other alloy satisfies the exacting demands of industry in so wide a range of applications as Circle Ⓛ 22, the time-tested "18 and 8". It is saving money every hour of every day by lengthening equipment life, cutting repairs and plant "down-time". It guards product quality against contamination by corrosion. In handling dangerous gases and liquors, men's lives depend on the integrity of castings made from this "18 and 8" alloy.

A set of data sheets describing Circle Ⓛ 22, 22 M and 22 XM, Lebanon's "18 and 8" alloys, is yours for the asking.

LEBANON CIRCLE Ⓛ 22

An "18-8" Alloy

NOMINAL ANALYSIS

Carbon Max.	0.07
Silicon	1.25
Manganese	0.75
Chromium	19.50
Nickel	9.00

NOMINAL PHYSICAL PROPERTIES

Tensile Strength	75,000
Yield Point	36,000
Elongation in 2"—%	50
Brinell Hardness	135

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"In The Lebanon Valley"

ORIGINAL AMERICAN LICENSEE GEORGE FISCHER (SWISS CHAMOTTE) METHOD

LEBANON ALLOY AND STEEL Castings CIRCLE L

Dear Editor:

RADIOACTIVE TRACERS

Sir:

Referring to your article "Radioactive Tracers in Steelmaking" in the April 29 issue dealing with the radioactive sulfur tracer experiment which we recently completed for Republic Steel, our suggestion that radioactive phosphorous be used for controlling the bessemer process has evoked several letters pointing out that phosphorous is not removed in the acid bessemer as used in the U. S. The word "basic" should have been emphasized as the example in the article referred to the bessemer process as utilized in Europe. It might be added that the basic bessemer process is an excellent steelmaking method. We hope you have not been forced to write too many explanatory letters on this omission.

B. S. OLD
Arthur D. Little, Inc.
Cambridge, Mass.

TRADE NAMES

Sir:

Will you please advise the writer where a copy of the trade name directory compiled by The Iron Age can be secured.

WM. A. ELRICK
Joseph T. Ryerson & Son, Inc.
Cambridge, Mass.

• **Directories are available at $3.00 each for one or two copies; $2.50 each for three to nine copies; and $2.00 each for ten or more copies.—Ed.**

VACUUM CASTING

Sir:

We are very interested in an article which appeared in your August 14, 1947 issue, but have been unable to obtain a copy of same. We wonder if you could send us a copy of this article which was "Wetheri Vacuum Casting Process."

CHAS. S. BYGATE
Rockwell Mfg. Co.
Pittsburgh

• **Tearsheets have been sent.—Ed.**

REBUILDING ENGINE PARTS

Sir:

Please send me tearsheets of "Plating Techniques for Rebuilding Aircraft Engine Parts" which appears in the May 6 issue.

K. G. PRESSER
Chief Metallurgist
Superior Engine Div., National Supply Co.
Springfield, Ohio

NSRB EMPLOYMENT

Sir:

During the past several months I have read a great deal concerning the functions of the National Security Resources Board and it is my understanding that this organization is now in the process of re-

Leads the World in Accuracy!

The DeVlieg JIGMIL is now recognized as The World's Leader in the field of accurate boring, in addition to its unique capacity for high productivity on:

1. **Single part precision boring.**
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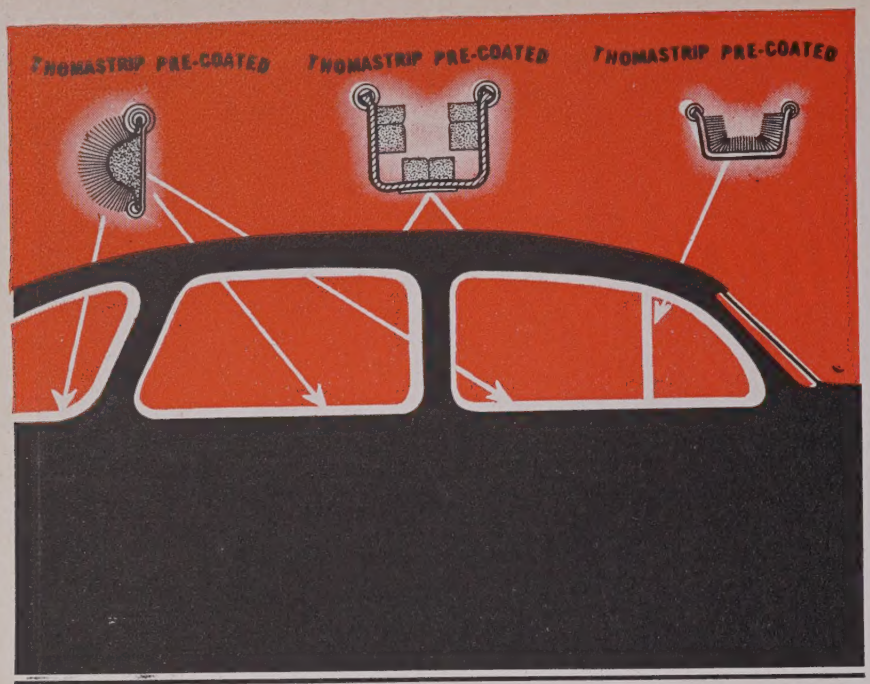

GLASS RUN CHANNEL and WEATHERSTRIP SECTIONS MADE OF PRE-COATED COLD ROLLED STRIP STEEL

A manufacturer with nation-wide distribution through automobile manufacturers, automotive jobbers and glass shops uses pre-coated ThomaStrip for automotive glass run channel and weatherstrip.

Where parts are not visible after assembly, electro zinc coated cold rolled strip steel is used. To give improved appearance where any surface is exposed, zinc coated ThomaStrip, pre-coated with black lacquer, has been adopted.

The use of ThomaStrip has been broadened by Thomas co-operation with manufacturers who wish to reduce costs and improve their products. Let us share our experience with you.

ELECTRO-COATED ZINC, COPPER, NICKEL AND BRASS . . . HOT DIPPED TIN AND SOLDER . . . LACQUER COATED IN COLORS . . . UNCOATED PRECISION STRIP, CARBON AND ALLOY SPECIALTIES

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COLD ROLLED STRIP STEEL
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COLD ROLLED STRIP STEEL SPECIALISTS

cruiting personnel. I am a metal lurgical engineer presently em ployed in the aircraft industry During the war I served with th Ordnance Department. I am inter ested in securing a position wit this organization and believe m experience with the metal indus tries should prove of value to NSRB

Having read your "Washington features in the April 8 issue dealin with the agency, I am writing yo for information as to whom to con tact regarding this matter.

NAME WITHHELD

• The Board is seeking technical personn of all types. Mr. Edward F. Wright, Perso nel Director, NSRB is the proper person t contact.—Ed.

PRECISION CASTING

Sir:

Please forward one copy of you booklet entitled "Precision Castin —Lost Wax Process" which I un derstand is sold for $1.00 a copy.

R. T. BEEGHLY
Metal Carbides Corp.
Youngstown

• A copy of the booklet has been sent.—E

ALUMINUM ALLOY 61S

Sir:

In your April 24, 1947 issue yo printed an article "Heat Treatmer and Aging 61S Sheet." I am anx ious to obtain a copy of this artic and would like to have you send m a copy of that issue or a reprint the article.

E. J. CLOVIS
Development and Engineering Di
Permanente Products Co.
Oakland, Calif.

• Tearsheets have been mailed.—Ed.

THREAD ROLLING

Sir:

We would appreciate receivin one copy of each of the three par of the article "Thread Rolling The ory and Practice" which appeare in the issues of Dec. 19 and Dec. 2 1946 and Jan. 9, 1947.

RAY FRONCILLO
Research Dept.
American Screw Co.
Providence

HIGH TEMPERATURE ALLOYS

Sir:

Will you kindly send a tearshe copy of the article "High Tempera ture Materials by Powder Meta lurgy" from the April 29 issue.

J. A. KEARNEY
Crucible Steel Co. of America
Harrison, N. J.

PRICE INDEX

Sir:

For a reseach report we are pr paring, comparable prices by ye for the period 1936 through 19 are required for both ferrous a nonferrous materials. The report to be broken down as fine as po sible. Therefore if you have info

mation indicating prices during this period on sheets, bars, tubes, etc., I will appreciate it if you make this available to us. Separate charts are being prepared to present the price changes on castings, so if separate figures are available on bronze, aluminum, steel and cast iron they will be helpful.

LEO J. McLAUGHLIN
Submarine Signal Co.
Boston

• **"Prices and Production" section in the Jan. 1, 1948 issue tabulates price quotations on a great many steel products, scrap, pig iron, nonferrous metals and other industry materials for the time period you are concerned with.—Ed.**

ELECTRONIC CONVERTERS

Sir:

Have you any tearsheets available of the article on "Electronic Frequency Converters for Induction Melting Furnaces" in issue of Sept. 25, 1947. A copy would be greatly appreciated.

P. F. GROVE
Chief Electrical Engineer
John Miles & Partners Ltd.
London

• **Tearsheets have been sent.—Ed.**

DIECASTING IRREGULARITIES

Sir:

We should like to obtain a reprint or tearsheets of the article "Causes of Die Casting Irregularities" from the Nov. 13 and 27, 1947 issues.

W. KAUDERS
Hydropress, Inc.
New York

• **Tearsheets have been sent.—Ed.**

AUTOMATIC TRANSMISSION

Sir:

We are anxious to obtain a copy of the article on the "Buick Automatic Transmission" which appeared in the Jan. 15 issue of your journal.

C. HURST
A. C. Wickman Ltd.
Coventry, England

STEEL COMPANY EARNINGS

Sir:

I understand that you have published a chart showing the earnings of the various steel companies. If this is the case, I would like to have a copy.

COOLIDGE SHERMAN
Asst. Sales Mgr.
Allegheny Ludlum Steel Corp.
Watervliet, N. Y.

• **"THE IRON AGE Financial Analysis of the Steel Industry, 1947-1946" from the April 8 issue that you are looking for. Reprints are available.—Ed.**

MACHINE TOOL TEXTS

Sir:

We are taking the liberty of calling on you for information regarding the availability of a text or handbook for use in training salesmen for our company. In addition

NEW
BIG THINGS *are being done with*
Fansteel

Molybdenum, Tungsten and Tantalum

Did you know that tungsten is the strongest of all metals at 1000°C (1832°F)? Or that molybdenum, another metal which retains good physical properties at high temperatures, can now be welded? Or that boiling aqua regia (and almost all other acids) do not attack tantalum at all?

These are only a few of the desirable properties of tantalum, tungsten and molybdenum. There may be a place in your process or product where one of these metals will bring about important improvements or cost savings. Or perhaps one of the many Fansteel alloys or powder metallurgy compositions would solve your problem exactly.

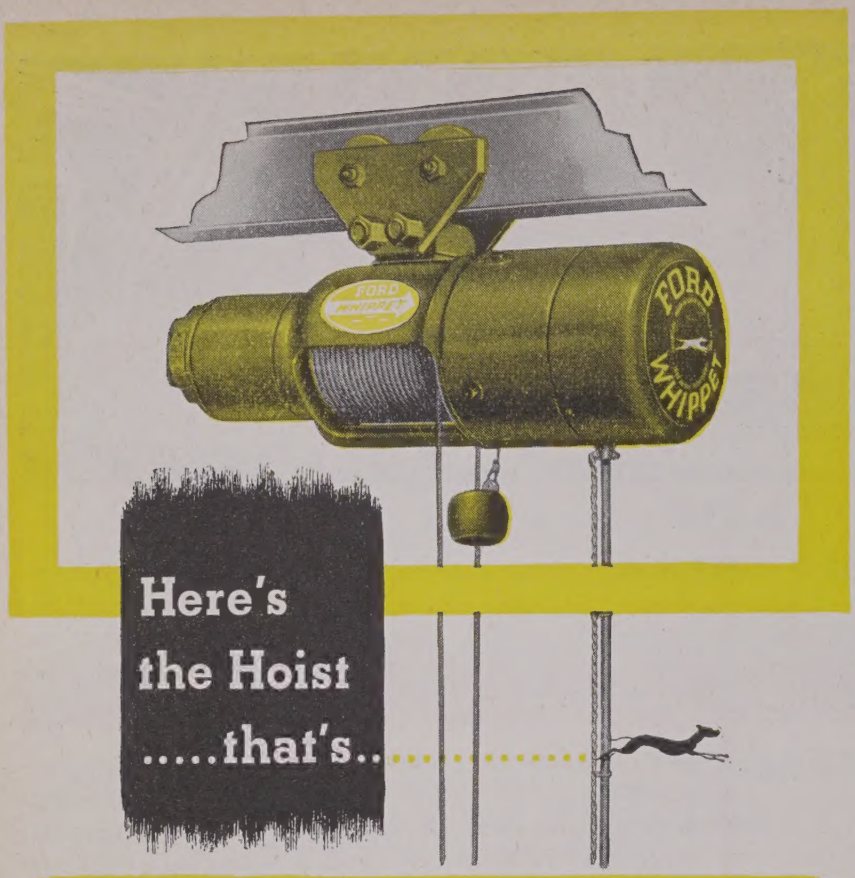
Why not get acquainted with Fansteel's galaxy of unusual metals, and Fansteel's equally unusual fabricating services? Fansteel Metallurgical Corporation, North Chicago, Ill.

PURE METALS
Tungsten, Molybdenum, Tantalum and Columbium in sheet, rod, wire and special shapes and parts.

POWDER METALLURGY PRODUCTS
Finished or semi-finished shapes and parts of special analysis to achieve high strength, density, electrical conductivity, resistance to wear, impact, heat, erosion, or combinations of these and other properties.

COPPER BASE ALLOYS
Copper alloyed with other elements, to combine high conductivity with strength, elasticity, resistance to heat, impact or wear. Available in bars, rod, sheet, strip, castings, forgings, finished or semi-finished parts, for electrical hardware, current-carrying springs, resistance welding electrodes, dies and fixtures.

Fansteel
SPECIAL PRODUCTS
In Controlled Metallurgy



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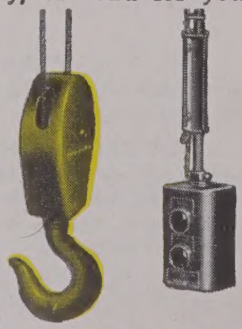
For years FORD has been developing and refining this new electric hoist. Now it has been tested, proved and acclaimed by users everywhere. The new FORD *Whippet* is an answer to your need for greater speed . . . moving more material per hour, or minutes, at less cost. It's fast, safe, dependable, sturdy. It runs smooth and easy—*slick as a whippet.* Wide range of capacities up to 1 ton. See your FORD distributor today, or send for your copy of folder DH-1325.



Ask your FORD distributor about the famous FORD Tribloc. He also offers a complete line of high quality spur-gear, screw and differential hoists —other special hoisting equipment.

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York, Pa., Chicago, Denver, Los Angeles, Philadelphia, Portland, San Francisco, Bridgeport, Conn.

FORD CHAIN BLOCK DIVISION
AMERICAN CHAIN & CABLE

TRADE MARK

In Business for Your Safety

to facilities for upsetting and drop forging, we have equipment for many finishing operations, including hollow milling, coining, drilling, broaching, etc. We are particularly interested in a good reference book covering these finishing operations and would greatly appreciate any suggestions for obtaining a handbook on machine shop practice that is of a general nature and elementary in scope.

H. R. RUSK
Manager of Sales
Columbus Bolt & Forging Co.
Columbus, Ohio

• **"Machine Tool Primer" published by H. D. Hall Foundation, Newark ($2.00) is a good elementary book on the various machine tools and their use. A book dealing to a greater extent with machine shop practice is "Running a Machine Shop," McGraw-Hill Book Co., New York ($4.25). This book goes into such subjects as estimating and should provide useful background information for salesmen. Broaching Tool Institute, New York, has published a small book on broaches which would be helpful in rounding out the subject, as the elementary books do not contain much information on coining and broaching.—Ed.**

PAGES TWISTED

• **Pages 88 and 89 in the article "Heat Processing Easily Oxidized Metals" by F. C. Kelley in the May 20 issue were transposed. The text on p. 89 should have been on p. 88 and vice versa.**

SLAB MILLERS

Sir:

Can you furnish me with names of companies which make equipment for scalping the surface of slabs of rolled metal? We are interested in equipment similar to the slab milling machines used in brass mills, but considerably smaller for use on 8-in. wide silver ingots.

SIDNEY SIEGAL
Development Engineer
General Plate Div., Metals & Controls Corp.
Attleboro, Mass.

• **Names of firms making slab millers small enough for your use have been sent.—Ed.**

PRACTICAL MANAGEMENT

Sir:

As subscribers what do we have to do to obtain a copy of your book, "Practical Management." If it can be purchased, please start the book on its way to us and your invoice will receive our immediate attention.

A. F. JENSEN
President
Hanna Engineering Works
Chicago

• **Copies of the book are $3.00 each and yours is on its way.—Ed.**

PRICING NAILS

Sir:

Your issues list base prices for merchant wire products. I would appreciate some clarification on the price given for galvanized nails. I presume that the working base for

TRANSUE FORGINGS

Steering Knuckle forging
produced by Transue . . .
weight 13.4 lbs.

USUALLY COST LESS AT THE POINT OF ASSEMBLY

Consult our engineers when you are contemplating conversion to forgings, or when you are in need of reliable forging service.

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OVER 50 YEARS OF FORGING PRODUCTION EXPERIENCE

PAGE
Stainless Steel
WIRE
ROUND

FLAT

OR

SHAPED

Page for Wire—Especially Stainless

Remember that the next time you are looking for a responsible source for stainless steel wire. Wire has always been the business of PAGE. And PAGE has been working with stainless ever since its earliest development.

Whatever problem you may have involving wire—

Get in touch with Page!

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Monessen, Pa., Atlanta, Chicago, Denver, Detroit, Los Angeles, New York, Pittsburgh, Philadelphia, Portland, San Francisco, Bridgeport, Conn.

PAGE STEEL AND WIRE DIVISION
AMERICAN CHAIN & CABLE
In Business for Your Safety

cut nails would be $6.30 per 100 lb carload. I am not clear as to what is meant by the figure 94, shown above on the page, applying to galvanized nails since no identifying unit is shown. It appears to me that possibly this might be a dealer markup over base price. Since I am not too familiar with the pricing of steel products, I would appreciate an explanation of this particular item.

LES L. FERREE
Pricing Manager

Reynolds Metal Co.
Louisville

• While formerly quoted by the steel industry on a dollars per 100 lb basis, nails and galvanized nails have recently been converted to a base column method of pricing which has been used for many years in the pricing of most other merchant wire products. This method is helpful to the merchant trade in calculating markups for extras as well as base prices. The figure 94 is the price for galvanized nails—$94 per net ton base price. Applicable extras would increase the price to the dealer. You are correct in reading the price for cut nails at $6.30 per 100 lb base in carload lots.—Ed.

OXYGEN IN THE CUPOLA

Sir:

If possible, we would like to have two copies of the article "Oxygen in the Cupola Blast" from your April 22 issue.

T. V. BUSK

Farrel-Birmingham Co., Inc.
Ansonia, Conn.

SILICA ROOFS

Sir:

Can you furnish our research library with tearsheets of your splendid article "The Openhearth Furnace—Making the Most of Silica Roofs" which appeared in the April 29 and May 6 issues.

C. H. FLICKINGER
Director of Research

Republic Steel Corp.
Cleveland

NONFERROUS SMELTERS

Sir:

It will be appreciated if you will advise where we can obtain a list of names, preferably a directory, of smelters producing lead bullion, base bullion and other metals and alloys, and refiners and processors of such metals and alloys.

H. W. ECKWEILER
Acting Chief Chemist

Treasury Dept., Bureau of Customs
New York

• Yearbook published by American Bureau of Metal Statistics, New York ($3.00) and the Standard Metal Directory, New York ($10.00) list smelters and processors of lead and other nonferrous metals.—Ed.

PIPE PRICES

Sir:

We are interested in placing some orders soon for several carloads of steel pipe, but are somewhat in the dark regarding current mill prices

for *more* output

UNTIE YOUR WORKERS' HANDS!

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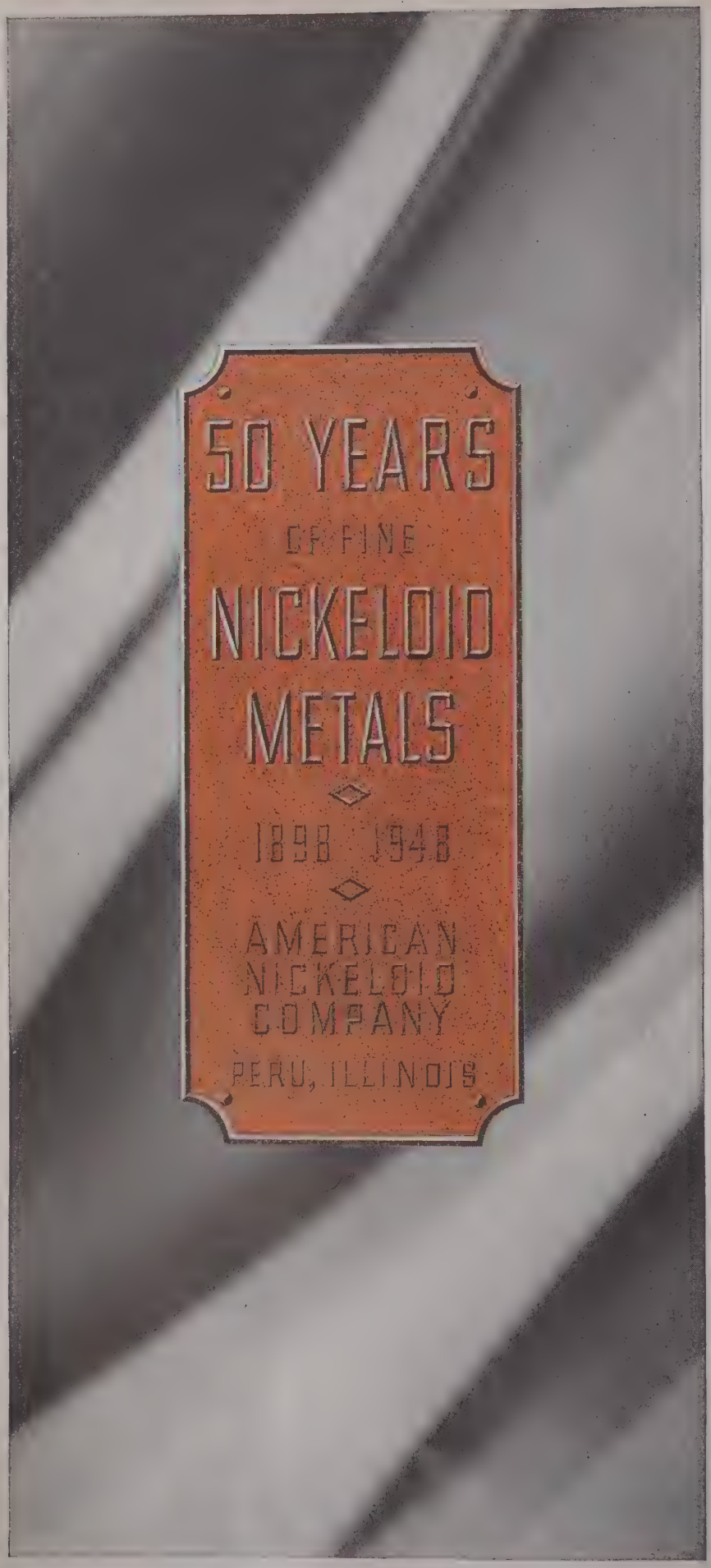

on pipe as quoted to leading jobbers.

Can you tell us if the mills have made any changes recently in official discounts on steel pipe, especially since the last announcement of price reductions proposed by the U. S. Steel Corp.

LINDSLEY H. BURR
Burr Sales Corp.
Franklin Square, N. Y.

• Several mills have already lowered steel pipe prices in accordance with the recent steel price reduction and some others are expected to follow. Weekly developments in this pricing can be followed by watching The Iron Age price pages. Tearsheets from our current issue have been sent.—Ed.

NONFERROUS WIRE CHARGES

Sir:

Will you kindly advise us whether you can supply straightening and cutting charges on nonferrous wire in a range of sizes from 0.207 to 0.028 in. inclusive. We are interested in the regular mill setup charges on aluminum, brass, copper and silver. Our efforts heretofore have been confined to carbon steel, but we are now interested in developing prices for the nonferrous materials listed.

E. A. CRAWFORD
Office Manager
Philip A. Rand Co.
Boston

• Because of the tremendous number of extras on both steel and nonferrous material, it is not feasible to publish a complete listing to include such charges. We are sending you a list of companies, however, that can supply you with the information you are seeking. You probably have customer contacts with these companies.—Ed.

IMPREGNATING CASTINGS

Sir:

We are in the business of impregnating leaky castings and therefore are interested in obtaining various types of information that may be helpful in our process or in the selling of our services. I am interested in knowing if your publication has ever presented any articles on impregnating castings.

GEORGE J. DULL
Partner
Approved Casting Impregnating Co.
Detroit

• Tearsheets of nine articles on the subject which have appeared in our issues of the past several years have been mailed.—Ed.

HEAT RESISTANT ALLOYS

Sir:

Are you reprinting the article "Summary of Heat Resistant Alloys" which appeared in the March 18, April 8 and 15 issues? If so, we would like to obtain six copies.

F. M. WEITLAUF
Timken Roller Bearing Co.
Canton, Ohio

• To meet the demand for the 28-page, three-part article, a reprinting has been necessary. Your request will be filled as soon as the reprinting is completed. Copies will be 20c each.—Ed.

The IRON AGE

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Time for a Breather

Perhaps you have forgotten such things, Mr. P. A., but isn't it time you gave some special attention to your rod and reel, your garden and your golf game. Yes, the vacation season is well under way, and if you're going to wander in the wide open spaces—better begin thinking about it.

We know you are having a tough time. Steel buying, like steel supplying, is no easy task these days. But a little rest now will pay off in new energy and a new outlook on your return.

While you're away, please know that we'll be doing everything we can to give your company prompt service on steel. With demand so heavy there may be times when we cannot meet all requirements. But you can be sure your associates will receive all possible cooperation from the nearby Ryerson plant, as you would yourself.

So break away soon for that grand and glorious vacation. You owe it to yourself, your family and your company. **Joseph T. Ryerson & Son, Inc.**

RYERSON STEEL

The IRON AGE

100 E. 42nd ST., NEW YORK 17, N. Y.

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JUNE 10, 1948

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Another Oscar

THREE rail unions which have stubbornly stalled the mediation efforts of the government and repudiated the judicial award of an impartial Emergency Board appointed by President Truman have hit the front pages with a demand for the nationalization of the railroads.

It will be well for the American public to look this proposal squarely in the teeth, to examine the costs, and to weigh the motives which induce a group of labor leaders to demand the collectivization of our rail transportation as part of a strategy of ruthless bargaining and callous intimidation.

This country has already experienced the doubtful virtues of rail nationalization. The carriers were taken over by the government during the First World War, operated for a few years, and then returned to private management. During this period the American railroads plumbed their all-time low in efficiency. Freight piled up in terminals. Rail schedules became a joke. Our carriers more and more began to resemble the French railroads which at the time had already been operating for some years under the dubious benefits of nationalization.

Our government with its basic horse-sense unaffected by labor pressure, restored the roads to private operation, brushed off its clothes, heaved a sigh of relief and said, "Never again." For the experiment cost this country approximately two billion dollars in direct outlay, plus another two billion dollars in taxes which were not collected. Every day of government operation cost the people of the United States two million dollars.

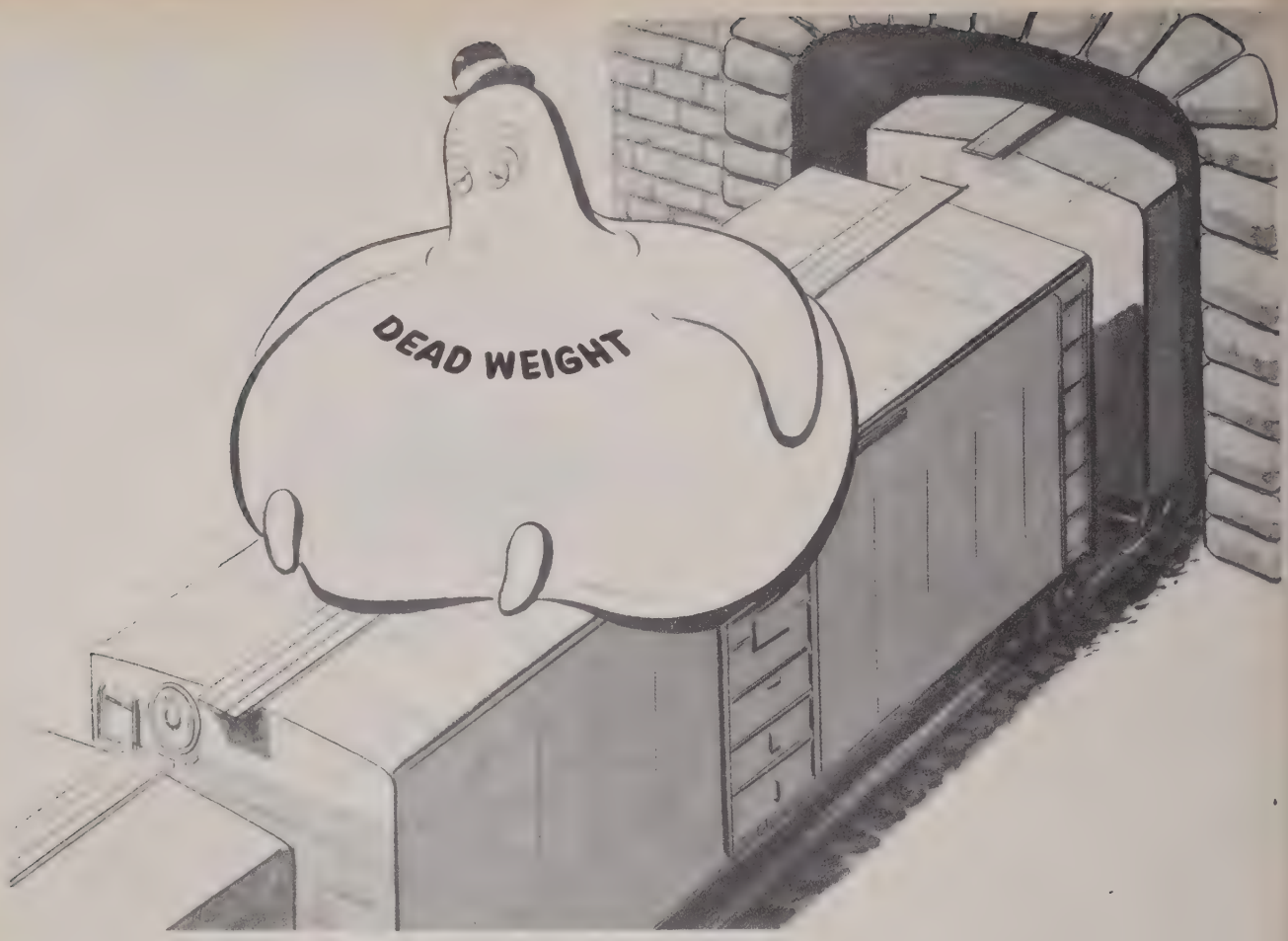
By contrast, the rails during the Second World War performed prodigies of transportation. Schedules were maintained. Freight was handled expeditiously and economically. The roads carried substantially more passengers and freight with less rolling stock than they did during the First World War. Under private management the railroads cost the government nothing. In fact, the carriers contributed approximately three million dollars a day to the Federal Treasury in the form of taxes.

Let's not lose sight of this lesson. If the roads are nationalized, the cost of carrying a ton of coal from Wilkes-Barre to Boston will rise. The cost of shipping flour from Buffalo to New York will mount. The friction of moving goods from the site of production to the point of consumption will become more expensive. The American public will foot the bill in the form of higher living costs, heavier taxes or most probably both.

Why do these labor leaders demand nationalization? They believe the government will be an easier boss with whom to bargain than private management. Official personnel can be threatened by political reprisal. Under nationalization politically-appointed management need not justify its position on the basis of efficient performance or profitable operation. The incentive to maintain discipline will inevitably suffer. The problem of the labor leader who wants all the traffic will bear is made that much simpler - or so he believes. This is in effect a demand that the American economy forfeit its defenses against deterioration in order to promote the designs of a selfish labor group.

If Oscars are ever provided for the purpose, we recommend one for union rail leaders for outstanding and magnificent indifference to the public welfare.

Joseph Stagg Lawrence



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Dead Weight Goes, Payloads Increase When You Switch to Low-Alloy, High-Strength HI-STEEL

You'll find that the cost of operating mobile equipment tumbles when you switch to units made of Inland Hi-Steel. This remarkable low-alloy steel has an unusually high strength-to-weight ratio . . . nearly double the working strength of ordinary structural steel, with more than 50% greater ability to stand up under dynamic loads. Because lighter sections can be used without sacrificing strength or safety, Hi-Steel decreases the weight of your equipment. In reducing dead weight, payloads are substantially increased, braking loads reduced, and operating costs lowered.

You get other advantages with Hi-Steel, too. It has about five times the atmospheric corrosion resistance of ordinary steel, and is far more resistant to abrasion. It can be worked hot or cold, with little or no change from standard shop practice.

To make larger tonnages available to you, other companies are licensed to make Hi-Steel. Write for Bulletin No. 11. INLAND STEEL CO., 38 S. Dearborn St., Chicago, Ill. Sales Offices: Chicago, Davenport, Detroit, Indianapolis, Kansas City, Milwaukee, New York, St. Louis, and St. Paul.

Hi-Steel meets the requirements of SAE Specification 950

INLAND HI-STEEL

THE LOW-ALLOY, HI-STRENGTH STEEL
Available in Many Forms

NEWSFRONT

► For the past 2½ years the steel industry has been unable to get to 100 pct of capacity operations because of the scrap and coke bottlenecks. Whether it can get to that point this year remains to be seen. An especially dim view is taken by those who lend an ear to the somber notes emanating from attempts to negotiate a coal contract. Until scrap, coke and ore are more plentiful, to talk about new capacity in big tonnages is to close ones eyes to the current problem--more use of what we have.

► The largest resistance welding wheels ever made are being installed on a new continuous pipemill to make 30 in. diam line pipe from 3/8 in. thick plates. The welding wheels are 8 ft in diam and weigh approximately 1 ton.

► The much-discussed nationalization bill for the British iron and steel industry probably won't be presented to the House of Commons before September. Although the Prime Minister is on record that the industry would be nationalized in the life of the present Parliament, the opposition has not given up hope of effecting some sort of compromise. Better British production has given a boost to their arguments against nationalization.

► Stainless steel valves, weighing from 10 to 15 pct of the weight of cast valves, are being designed for use in pipelines carrying chemicals and other corrosive materials. Applications are expected to be confined to stainless piping where pressures are not high.

► A West Coast firm is transporting fabricated structural steel to Hawaii by barge and hauling scrap to this country on the return trip. The company hopes to return about 10,000 tons of scrap to this country from the territory by this means. Work is being carried out under contract with the Territory of Hawaii Commission.

► If automobile prices go up because of Detroit wage increases--as well they may--history indicates the public will blame steel producers. Car price boosts last August followed July steel price increases. The second round wage hikes, then 3 months old, were practically ignored and steelmakers took the rap. Steel prices may be forced up by next August for a repetition of the cycle.

► England's work on radio-guided rockets for defense against aircraft is to be handed over by the government to private firms. Government efforts will be concentrated on laboratory research, the results of which will be passed on to the manufacturers.

► Offerings of foreign steel on the American market have created a dither in some domestic circles. Question most frequently asked is, "Can countries now offering continue to do so after they receive ERP steel from the United States?" Since ERP has the U. S. holding the economic cards in this respect, it is unlikely that any recipient nation would ignore a "request" to cooperate. However, a vigilant eye will be needed to prevent steel shipments from bypassing intended end use.

► A substitute for Elgiloy, the watch spring material recently developed, is expected to be marketed within a short time. The manufacturer claims that the physicals of the new alloy are as good as in Elgiloy and that the product will be considerably cheaper.

► The metallurgical subcommittee of the Economic Commission for Europe will again survey scrap supplies and needs in Europe--especially in Germany. It is expected to determine how much scrap will be available after Europe's needs are taken care of. American steel firms, who have had their own scrap missions trying to purchase scrap throughout the world, know where the scrap is located, as well as about how much is available. But they insist that finding it and buying it are two different things.

► Reports from Germany indicate that "Operation Severance", designed to decartelize the iron and steel works in the British zone is near completion. A North German Iron and Steel Industry Management is expected to be set up to take care of matters regarded as beyond the scope of the individual units established after the plan comes into operation. There is opposition to the plan from both industry and workers. Industry wants bigger units--about 1 million tons. Trade unions want nationalization of the industry.

► Foreign conversion deals may be in the offing. A large European pipe producer has a big order for pipe from an American oil company. A spokesman for the pipe producer said they would be delighted to fill the order if the oil company would provide the semifinished steel.

The Practical Economics of

A simple, quick method of determining the economic feasibility of radio frequency heatng for through heating, surface hardening, soldering or brazing, or dielectric heating without an investment in a technical investigation is described in this article. The method involves some simple arithmetical calculations and a series of check charts.

B. T. P. KINN
Industrial Electronics Div., Westinghouse Electric Corp., Baltimore

TECHNICALLY, radio frequency heating may seem the perfect answer to a specific production problem, but cost-wise it may not be feasible. Correct application has been complicated by lack of experience dealing with this new tool, but information has been collected to make a simple economic analysis of any application prior to technical investigation. Technical knowledge necessary to a satisfactory economic study of radio frequency heating has been formulated into charts that are so easy to use that there is no longer a need, in a large majority

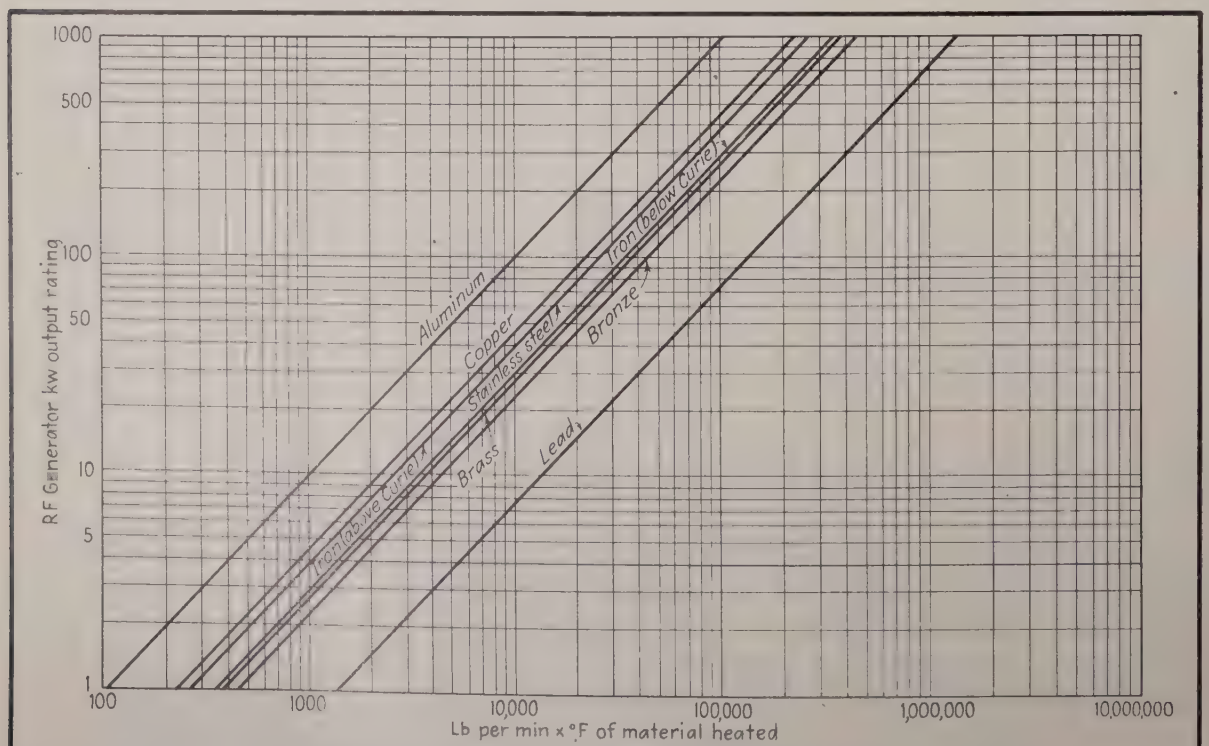


FIG. 1 - Oscillator power capacity for radio frequency heating requirements.

Radio Frequency Heating

• • •

of cases, for an extensive technical study prior to an economic survey. These charts make the economic survey a simple operation even without prior experience with RF heating. To determine whether or not RF heating will pay, a few well defined steps have to be studied.

STEP I. ***It must be assumed that the application considered is technicaly possible.***

This is important because in so doing expensive and time-consuming laboratory tests or engineering study is bypassed. Experience has shown that many applications are much more likely to be technically sound than financially sound.

STEP II. ***The application must be properly classified.***

This is done by determining into which of the four general classifications the particular application resolves itself: (1) Through heating, the heating of a mass of metal to a given temperature in a given time, as in heating for forging, heat treating or melting. (2) Joining metals, as in soldering or brazing of similar or dissimilar metals. (3) Surface hardening, as in surface or case hardening steel parts such as gear teeth, wrist pins or bearing surfaces. (4) Dielectric heating, or heating any and all materials other than metals for such applications as preheating, bonding, drying or curing.

STEP III. ***The size of RF generator needed to accomplish the result desired must be determined.***

The procedure in this step will vary according to the application classification under Step II. By summarizing technical experience into easily usable charts, the need for technical knowledge in this step has been eliminated. The curves on these charts are based on theoretical calculations which have been confirmed by data taken from applications and numerous laboratory tests. They represent average conditions and therefore provide suitable data for a preliminary economic survey. They are not intended for final accurate engineering analysis, since they cannot take into account all of the detailed requirements associated with a given operation.

If the application has been classified as *through heating*, analysis is made by the use of

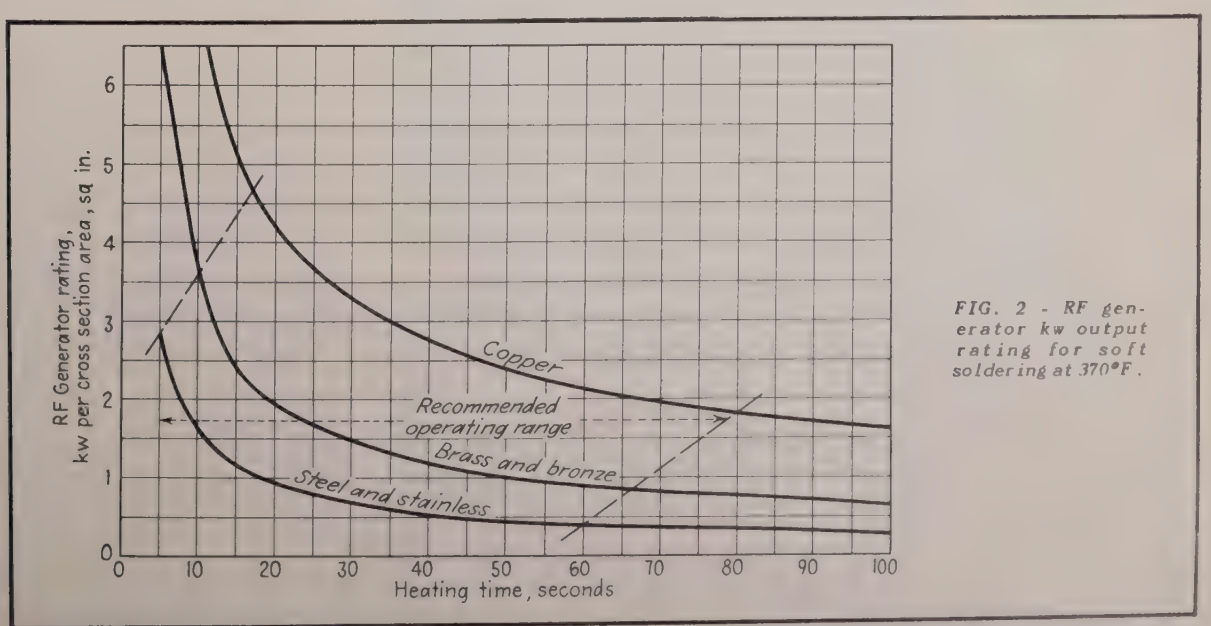


FIG. 2 - RF generator kw output rating for soft soldering at 370°F.

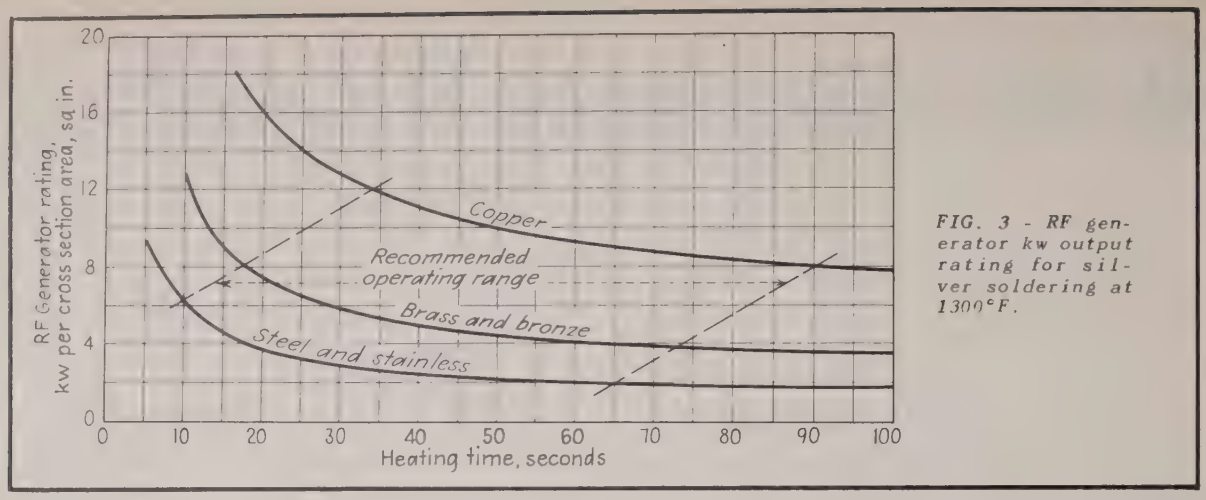


FIG. 3 - RF generator kw output rating for silver soldering at 1300°F.

fig. 1, which shows the generator size for induction through heating. It includes thermal power required and power losses typical of through heating applications, such as coil, coupling, thermal radiation and convection losses. The magnitudes of these losses cover average conditions. To use the chart, the pounds of material per minute to be heated are multiplied by the desired temperature rise in degrees F. The curve is then chosen for the particular material involved and a direct reading of generator size is obtained.

All types of soldering and brazing fall under the classification of *joining of metals*. Jobs are segregated into those using soft solder and those using hard solder. The procedure for either type is identical, but the data to be used is obtained from different charts. Fig. 2 is used for soft soldering and for hard soldering fig. 3 shows the necessary generator size. These charts include: (1) Power required to heat the joint, (2) power lost because of heat flow away from the joint, (3) coil losses, (4) coupling efficiencies, (5) thermal radiation, and (6) convection losses typical of such applications.

The method of using either chart is the same. The first step is to arrive at the cross-sectional area in square inches of each part involved. The area required in most cases is the area of each side of the junction which is perpendicular to the flow of heat away from the joint. This is true because conduction loss is the major heating factor in most joining applications. Next, the production rate desired in pieces per day or pieces per hour must be expressed in terms of time required to make one brazed or soldered joint. In other words, it must be determined how fast the job must be done. The appropriate chart is consulted to determine the approximate power required per square inch to heat the material involved. This power density is then multiplied by the area of each part involved in the joint, and the products are then added to obtain the power in kw required per piece.

For joints involving dissimilar materials, such as steel and brass, the required power density for each type metal is obtained from the chart and multiplied by the corresponding area to get the power required for each material. The total power in kw is again the sum of the two values

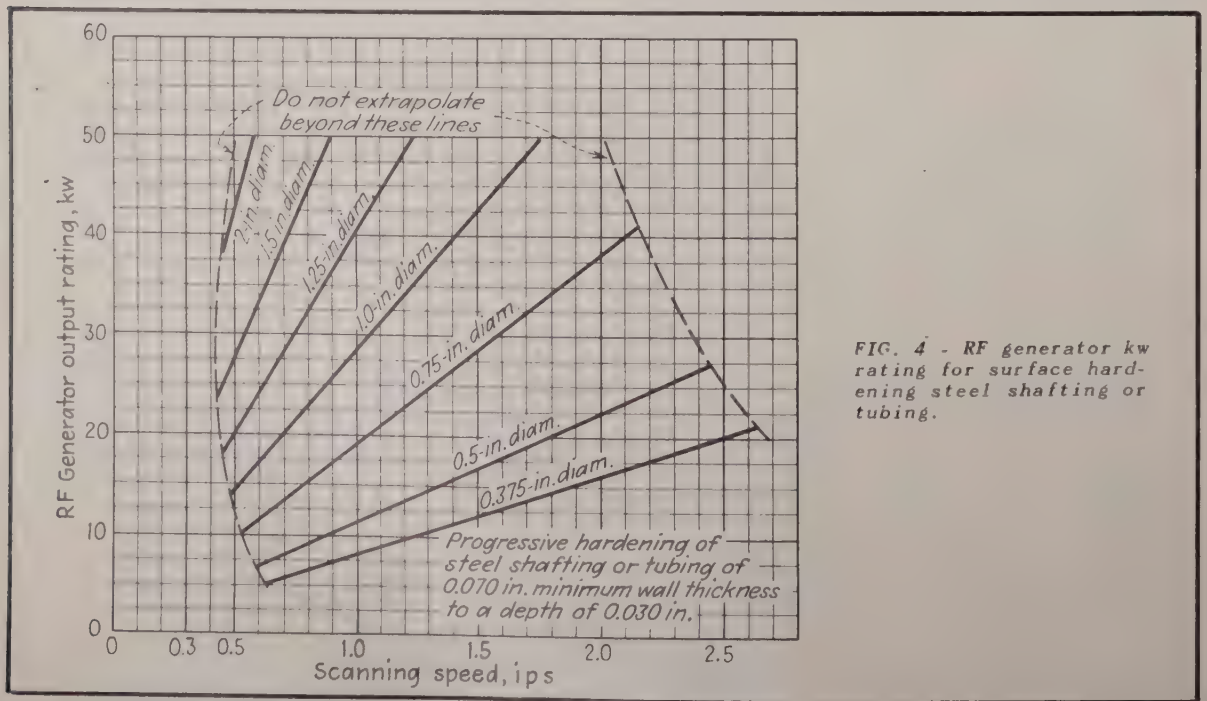

RF Generator output rating, kw
Scanning speed, ips
Do not extrapolate beyond these lines
2-in. diam.
1.5-in. diam.
1.25-in. diam.
1.0-in. diam.
0.75-in. diam.
0.5-in. diam.
0.375-in. diam.
Progressive hardening of steel shafting or tubing of 0.070 in. minimum wall thickness to a depth of 0.030 in.

FIG. 4 - RF generator kw rating for surface hardening steel shafting or tubing.

obtained.

Some brazing or soldering jobs require little power per piece. In such cases, production requirements are often high enough to warrant a larger size generator for the processing of a number of joints simultaneously. Usually, a study of two or three combinations of generator size, time, and number of pieces will reveal the most economical combination. Since these charts allow only for the chosen heating time, an allowance for handling time should be included to arrive at a reasonable production rate per hour.

For *surface hardening of steels*, it is assumed that all jobs will be of a progressive hardening or scanning technique. That is, the work will be fed progressively through a work coil supplying power to a small area to provide the high power density required for successful hardening. Because of the high power concentration required for surface hardening, the scanning technique is almost universally used. To surface harden a large area all at once, the generator size, in most cases, would be so large as to prove uneconomical.

To estimate progressive hardening, the chart shown in fig. 4 is used. This chart is for SAE 1045 steel with a core depth of 0.030 in., which is average for most applications. Steels containing 45 points or more of carbon will follow this chart closely. The required generator size is given directly as a function of the diameter of the piece to be hardened and the scanning speed. The scanning speed is easily determined by knowing the length of the hardened area and the production required. Scanning speed should be expressed in inches per second. Most scanning jobs are done on hand loaded work handling equipment. Therefore, handling or loading time must be taken into account when arriving at the scanning speed desired.

The chart in fig. 4 is based on round solid shafting or tubing with a wall thickness of 0.070 in. or greater. Should the piece to be hardened be of irregular cross section, it should be converted into an equivalent circular diameter, that is, one which has a circumference equal to the periphery of the irregular piece.

Dielectric heating has a wide field with practically an unlimited range of materials that might be heated. Dielectric heating can be used to heat all materials which are poor conductors of electricity. In general, this means everything not considered a metal and includes some liquids such as water in both liquid and frozen or solid form.

Because of the variety of materials, the chart shown in fig. 5, prepared for dielectric heating, makes use of specific heat of the material as the determining factor. To use the chart for determining generator size, it is necessary to know the amount (pounds per minute) of material to be processed for a given temperature rise. By checking the curve labeled with the specific heat of the material being analyzed, the generator size can be read directly from the chart.

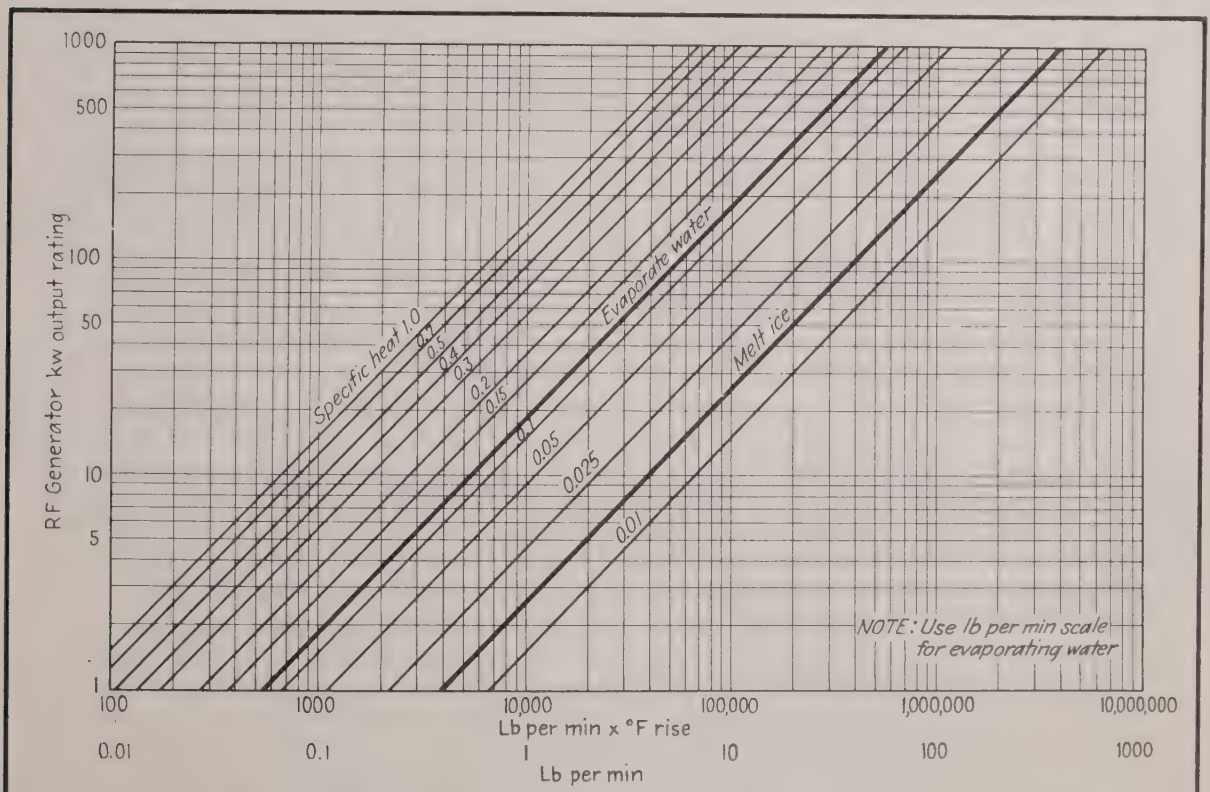


FIG. 5 - RF generator kw output rating for dielectric heating.

In applications calling for the evaporation of water or the melting of ice, the pounds of water to be evaporated or of ice to be melted per minute must be determined, and the corresponding curve used. The power so obtained is the amount necessary to supply the required heat of vaporization or fusion only. To it must be added the power required to raise the temperature of the water or ice, as the case may be. This power is

TABLE I

Operating Cost, $ per Hr*

NEMA Generator Rating, KW	Duty Cycle, Percent 100	80	60	40	20
1	$0.20	$0.184	$0.168	$0.152	$0.135
2	0.24	0.22	0.20	0.18	0.16
5	0.00	0.40	0.37	0.33	0.30
10	0.70	0.65	0.59	0.53	0.47
20	1.25	1.15	1.05	0.95	0.85
50	2.90	2.67	2.44	2.20	1.96
100	5.15	4.75	4.33	3.90	3.50
200	7.90	7.30	6.65	6.00	5.35

* These figures are based on average 1947 market levels.

determined from the chart in the normal manner, remembering, of course, that water has a specific heat of 1.0 and ice a specific heat of 0.5. When the specific heat of a material includes the water contained within the material, no separate figure is necessary for raising the water to temperature. In all cases, however, where water is evaporated, power for vaporization must be obtained separately and included in the final figure.

This chart, fig. 5, since it is based upon thermal factor only, gives the minimum possible size of RF generator required. Because of electrical factors present, the actual capacity required may be greater.

STEP IV. *Having determined the generator size, ascertain its cost of operation.*

All factors which affect the cost of operation of an RF generator, such as power cost, amortization, tube cost and maintenance have been incorporated into table I, for all NEMA standard size generators. For most applications, continuous operation at full output from the generator is never realized. For this reason, fig. 6 shows cost figures for various duty cycles of RF generator operation. If the duty cycle cannot be estimated, the 100 pct duty cycle operating cost figure should be used.

TABLE II

Induction Heating*

Type of Work Handling Equipment	20 KW and Smaller	50 KW and Larger
Hand loaded Hand operated fixtures Single position operation	$75—$600	$200—$1000
Hand loaded Hand operated fixtures Dual position operation	$350—$1200	$600—$1500
Hand loaded Mechanized fixtures Conveyor belt or turntable	$1500—$3000	$2000—$4000
Hand loaded Mechanized fixtures with quench spray for progressive heating	$3000—$5000	$4000—$7000
Mechanized system with Centrifugal hoppers for orienting regular shaped parts through fixtures, work coil and quench	$4000—$6500	$5000—$10,000

* These figures are based on average 1947 market levels.

STEP V. *Determine the total cost of operation by RF heating.*

To the operating cost of the RF generator must be added the labor cost for operation and the cost of accessory equipment such as fixtures, conveyors, or automatic handling equipment. Where a very careful analysis is being made, the cost of floor space and maintenance on accessory equipment can also be taken into account. For most preliminary studies, however, these items can be neglected. Should they be desired, experience within a given plant will provide the proper figure.

No chart is required to supply labor cost. The wage scale of a given plant can be consulted and it can be assumed that not more than one operator per RF generator is necessary to carry on production. In some applications, such as preheating material prior to molding, the operator of existing equipment, such as a press, can also operate the RF generator in a scheduled time cycle and no additional labor charges need be added. Where semi-automatic or continuous conveyorized work handling equipment is involved, labor estimates should be reduced accordingly.

Accessory equipment cost is probably the most difficult item to estimate with any accuracy because such equipment can vary, depending upon the degree of complication required on a given job. However, data has been compiled from cost analysis on numerous applications for both induction and dielectric heating which is given in tabular form as a guide on this phase of the analysis. Because accessory equipment differs quite radically for induction and dielectric heating applications, the data has been compiled into two tables, table II for induction heating and table III for dielectric heating operations.

To use these tables, the type of loading and the operating procedure necessary to obtain the desired production rates must be first determined. From the tabulation, the cost range for the type of work handling equipment necessary is obtained. A relative cost is selected from this range, which is based on whether the application is of the simplest or of the most complex within the range selected. Factors which influence the complexity of induction heating systems are: (1) Production rate; (2) method of feed (hand, semi-automatic or full automatic); (3) generator size; (4) variety of parts to be handled; (5) accuracy of work positioning; and (6) type of quench, if required. In addition for dielectric heating, such factors as: (1) Supplementary heating or drying air, (2) oven type enclosure, (3) complexity of shielding, (4) transmission lines, and (5) tuning networks, must be taken into account.

Where there is doubt regarding the selection of a suitable cost figure from tables II or III, it is usually best to select a value somewhat above the average figure in any one range. Usually a quick study of generator size and the time cycles involved, as covered in Step III, will show the

degree of complication involved in the work handling equipment.

Once the value of accessory equipment has been selected, it should be converted into dollars per hour of amortization costs, based on any selected period for amortization. In the case of the RF generator, a time of 30,000 hr was used to arrive at the amortization cost. It is suggested that this figure be used for all work handling equipment not of the hand operated type. For hand operated equipment involving simple fixtures and similar devices, a figure of 10,000 hr will give average conditions.

Where factory floor space is to be included in the analysis of operating cost, the figures in table IV may be used as a guide to the average floor space required.

STEP VI: ***Compare RF cost with the cost of other processes.***

The total cost of operating the RF equipment is the sum of the RF generator operating cost (*Step IV*) and the labor and accessory equipment amortization costs (*Step V*). This cost should normally come out in dollars per hour of operation.

In all cases, the total will have to be converted into terms of cost per piece, cost per pound, cost per cubic foot, etc., as dictated by the product being handled.

Finally, this figure has to be compared with similar figures of cost on other methods of processes, either already known or contemplated, which will provide the same production rate. Here, care should be taken to see that comparative cost data are of equivalent accuracy to permit reasonable results.

If this comparison shows a substantial saving through the use of RF heating, the problem can then be presented to the RF heating engineer with confidence that if it is found to be technically feasible, the application is worthwhile. On the other hand, if the figures show other methods to be cheaper, the application should be seriously questioned or even definitely discarded, at least for the time being. Future developments and changing trends in equipment and processes may eventually make such applications economically sound.

In cases where the analysis shows rather close competition between RF and other methods, further investigation is warranted into possible savings in floor space, improved working conditions, and the ever important possible improvement in product quality.

While the technique of making an economic study of RF heating has been explained, an example of how the method is applied may help show how the charts are utilized and how to make assumptions where necessary to get indicated results.

A *through heating* example involves heating the ends of a steel rod prior to an upsetting operations which will form the head of a valve, such as that shown in fig. 6. The upsetting operation is done in two stages in an automatic machine. Six rods are handled simultaneously, and the desired production rate is 1000 per hr.

The first stage of heating required that 1 in. of the rod be heated to 1800°F and the second stage required reheating from 1000°F to 1800°F for a distance of ¾ in. from the end. Assume it is necessary to heat 125 pct by weight to allow for conduction of heat along the rod. To determine the generator size for the first heating stage:

Weight = 125 pct x length x cross-sectional area x lb per cu in. for steel

0.276 lb = 1.25 x 1 in. x ¼ in. x π x 0.282 lb per cu in.

To obtain the actual heating time, a handling time for inserting and removing the part from the coil must be assumed. Assuming this time is 1.5 sec per stage, then the time during an hour not used for heating is:

$$\frac{1000 \text{ per hr}}{6} \times 1.5 \text{ sec} = 250 \text{ sec or } 4.16 \text{ min}$$

$$\text{Lb per min to be heated} = \frac{0.276 \text{ lb} \times 1000 \text{ pieces}}{(60 - 4.16) \text{ min}} =$$

4.95 lb per min

Lb per min x temperature rise = 4.95 x (1800-70)°F = 8550

From fig. 1, the power required, or the generator size, for the first heating stage is 35 kw.

TABLE III

Dielectric Heating*

Type of Work Handling Equipment	20 KW and Smaller	50 KW and 100 KW
Hand loaded hand operated cage with electrode	$250—$1500	
Hand loaded electrodes in press transmission line manual adjustable network	$2500—$4500	$5000—$10,000
Hand loaded mechanized conveyor transmission line manual adjustable network and oven type enclosure	$7000—$15,000	$10,000—$25,000
Hand loaded mechanized conveyor transmission line manual adjustable network, supplementary blowers, exhaust fans steam coils and oven type enclosures	$10,000—$20,000	$25,000—$60,000

* These figures are based on average 1947 market levels.

TABLE IV

Floor Space Required by Various Radio Frequency Generators

Generator Rating, KW	Average Floor Space Required, Sq. Ft	
	Induction Heating	Dielectric Heating
2	25	25
5	40	30
10	50	40
20	75	85
50	115	160
100	175	225
200	225	

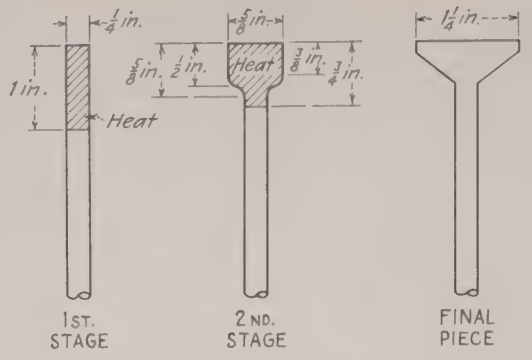


FIG. 6 - Through heating example, showing two stage heating and upsetting into a valve.

To determine the generator size for the second heating stage, the technique is the same as shown.

Weight = [½ in. x (⅝ in. x π) x 0.282] + [1.25 x ¼ in. x (¼ in. x π) x 0.282] = 0.276 + 0.069 = 0.345 lb total

$$\text{Lb per min} = \frac{0.345 \times 1000 \text{ pieces}}{(60\text{-}4.16) \text{ min}} = 6.2 \text{ lb per min}$$

Lb per min x temperature rise = 6.2 x (1800-1000)°F = 4960

From fig. 1 the power required or the generator size for the second heating stage is 20 kw.

The first stage must use a standard size 50 kw generator and the second stage must use a standard size 20 kw generator. The following step shows how to determine the cost of operation of equipment required to perform the described work.

$$\text{50 kw generator duty cycle} = \frac{35 \text{ kw} \times 100}{50 \text{ kw}} = 70 \text{ pct}$$

20 kw generator duty cycle = 100 pct
Cost of operating 20 kw unit (table I) = $1.25 per hr
Cost of operating 50 kw unit (table 1) = $2.55 per hr

Assuming one operator for complete operation = $1.75 per hr, less overhead, the total cost of operation = $5.55 per hr, and the cost per piece would be $\frac{\$5.55}{1000}$, or = $0.0055.

Work handling was not included in this case as it is part of an automatic machine. Labor does not include overhead. Overhead can be included at the regular costing rate in the plant.

Another example of figuring the cost of RF heating is in a brazing application. The part shown in fig. 7 was originally set up as a furnace brazing operation, at a processing cost of $0.015 per piece. Some of this cost was the result of the handing involved in having the part processed by an outside company. Production required that 10,000 pieces be joined in an 8-hr day. Following the procedure for brazing, by using fig. 3 for hard soldering, the area of each section must first be determined.

$$\text{Area AA} = \left[\pi \times \frac{(5/32 \text{ in. diam})^2}{4}\right] = \text{(Area of Circle)} = 0.019 \text{ sq. in.}$$

Area BB = [⅝ in. x 3/32 in.] = [0.625 x 0.093] = 0.058 sq. in.

Assuming a brazing time of 20 sec and using fig. 3:

Power required for section AA
4 x 0.019 = 0.076 kw

Power required for section BB
7.4 x 0.058 = 0.429 kw

Total = 0.505 kw or 0.5 kw

With approimately 0.5 kw required per piece it is obvious that with a 2 kw generator, four pieces could be processed at one time; or with a 5 kw generator ten could be handled at one time. A quick glance at these figures shows that by using the 5 kw generator and processing ten pieces at a time, an approximate production time schedule would be:

Heating time	20 sec
Loading time	10 sec (1 sec per piece)
Unloading time	5 sec
Total	35 sec to braze ten pieces

This totals 3.5 sec per piece, and 10,000 pieces would require 35,000 sec or 9.75 hr.

There are two things wrong with this schedule. First, the loading time is short, even with a well designed fixture; and, second, the production is not achieved in an 8-hr day, even when allowing for no operator inefficiency.

By adding a second work station and a transfer switch (accessory equipment), it would be possible to load and unload one fixture while the other is heating. Such an arrangement would give a time schedule approximately as follows:

Heating time	20 sec (loading and unloading)
Transfer time	5 sec in 20 sec
Total	25 sec (or 2.5 sec per piece

This scheduling totals sec, or hr for 10,000 pieces, and gives the desired production with 0.85 hr for operator inefficiency as well as a reasonable loading time of 20 sec.

$$\text{Generator duty cycle: } \frac{20 \text{ sec}}{25 \text{ sec}} \times 0.9 \text{ (operator efficiency)} \times 100 = 72 \text{ pct}$$

Actual cost of operating 5 kw generator (table I) = $.39 per hr

$$\text{Cost of two fixtures per hr } \frac{\$1000}{10{,}000 \text{ hr}} = .10 \text{ per hr}$$

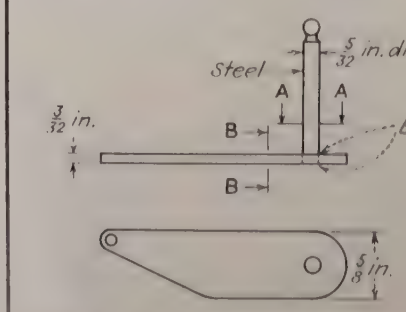
Cost of operator per hr, less overhead = 1.25 per hr

Total operating cost = $1.74 per hr

$$\text{Cost per piece} = \frac{\$1.74 \times 8 \text{ hr}}{10{,}000 \text{ pieces}} = \$0.0014$$

Note that this value is 10 pct the original cost, which represents a daily saving of $135. This

FIG. 7 - Brazing example of RF heating, joining steel pin to brass plate.



saving will return the initial investment cost of the generator and fixtures in less than two month's time.

If the daily requirement were to be cut to 1000 pieces, an easy time schedule, using only one fixture, could be established as follows:

Heating time	20 sec
Loading and Unloading time	50 sec
Total	70 sec for 10 pieces or 7 sec per piece

$$\text{Then } \frac{7 \text{ sec} \times 1000 \text{ pieces}}{3600 \text{ sec}} = 2 \text{ hr actual working time.}$$

Using the same operating cost figure of $1.74 per hr obtained previously, which incidentally is now slightly high because of the lower use factor, a piece cost of $0.0035 is obtained. This value still represents a major savings of $11.50 for each day's production and makes the equipment available 6 hr per day for other possible jobs, by providing the jigs and fixtures required.

An example of a surface hardening operation is shown in fig. 8. The shaft shown was previously through hardened, which caused distortion and necessitated a straightening operation to keep the shafts straight to within 0.003 in.

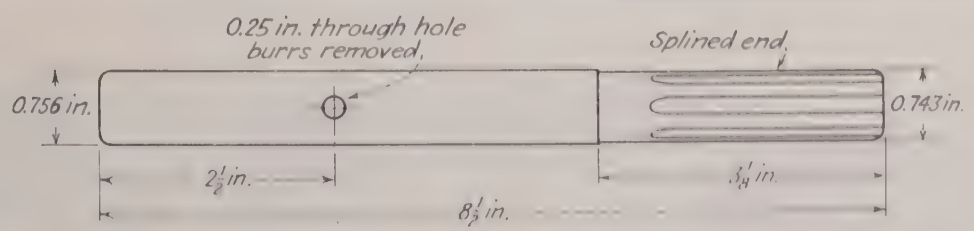


FIG. 8 - This shaft is SAE 1340 steel, hardened to Rc 42 to 46 by high frequency induction heating.

By surface hardening the entire shaft including the splined area, using RF equipment, the straightening operation was eliminated. This resulted in a material saving in cost and a superior shaft. With a desired production rate of 1500 pieces per 8-hr day and an assumed handling time of 5 sec per piece, the estimated scanning speed is figured as follows:

5 sec x 1500 pieces, handling time	7,500 sec
8-hr day	28,800 sec
Time for work	21,300 sec

Assuming operator efficiency of 80 pct:

Actual time for work		17,000 sec
Time per piece, 17,000 ÷ 1500		17,000 sec
Scanning speed $\frac{8.5 \text{ in.}}{11.3 \text{ sec}}$	=	0.755 ips
Required generator, size, from fig. 4	=	18 kw
Standard generator size	=	20 kw

Using the full 20 kw and a scanning speed of 0.85 ips, a process time of 10 sec plus 5 sec for handling, or a total of 15 sec per piece, is obtained.

Generator duty cycle $\frac{10 \text{ sec}}{15 \text{ sec}}$	=	67 pct
Cost of 20 kw generator operation, table I	=	$1.09 per hr
Cost of one operator, less overhead	=	$1.75 per hr
Cost of work handling equipment, table II, $5,000 ÷ 30,000 hr	=	$0.17
Total operating cost	=	$3.01 per hr
Cost per piece, induction hardened $\frac{\$3.01 \times 8 \text{ hr}}{1500 \text{ pieces}}$	=	$0.016

The process previously used called for processing 440 shafts at one time in a 75 kw electric furnace operating for 2 hr, 1 hr of which was at 50 pct load. This hardening operation was followed by a scaling operation and a straightening operation before the shaft was considered ready for grinding. The cost per shaft by this method can be arrived at in the following manner:

75 kw of power for 1 hr at $0.015 per hr	=	$1.12
37 kw of power for 1 hr at $0.015 per hr	=	.55
Labor cost for loading and unloading furnace, 10 sec per piece, and $1.75 per hr	=	$2.13
Scale removal operation, ½ min per piece and $1.75 per hr	=	$6.50
Straightening operation, ½ min per piece and $1.75 per hr	=	$6.50
Burr removal from spline, $0.50 per 100	=	$2.25
(NOTE: RF heating burns off burrs automatically.)		
Total cost for 440 pieces	=	$19.05
Cost per piece by furnace method	=	.043
Cost per piece by induction method (RF heating)	=	.016
Savings per piece	=	.027
Savings per day	=	$40.50

This savings is more than sufficient to pay off the initial investment in equipment in one year.

There are applications for which RF heating is extremely uneconomical at the present stage of development. One example that can be cited is the drying of foundry sand where dielectric heating not only heats the material but also handles the moisture within the material. Dielectric heating is of greatest advantage in processes where uniformity of heating throughout a mass of material is important. The other main advantage is the rapid rate of this uniform heat that can be obtained. Industries such as plastic molding, rubber molding and curing, wood gluing of all types, textile twist setting and drying, and in the food industry for preheating cereals, deinfestation of grain and cereal products have utilized RF heating.

The same is true for induction heat where the extreme high speed of heating and the accurate control of the applied heat is desired. Induction heating is used extensively for melting, forging, metal joining, heat treating and hardening.

Reverberatory Melting of

o o o

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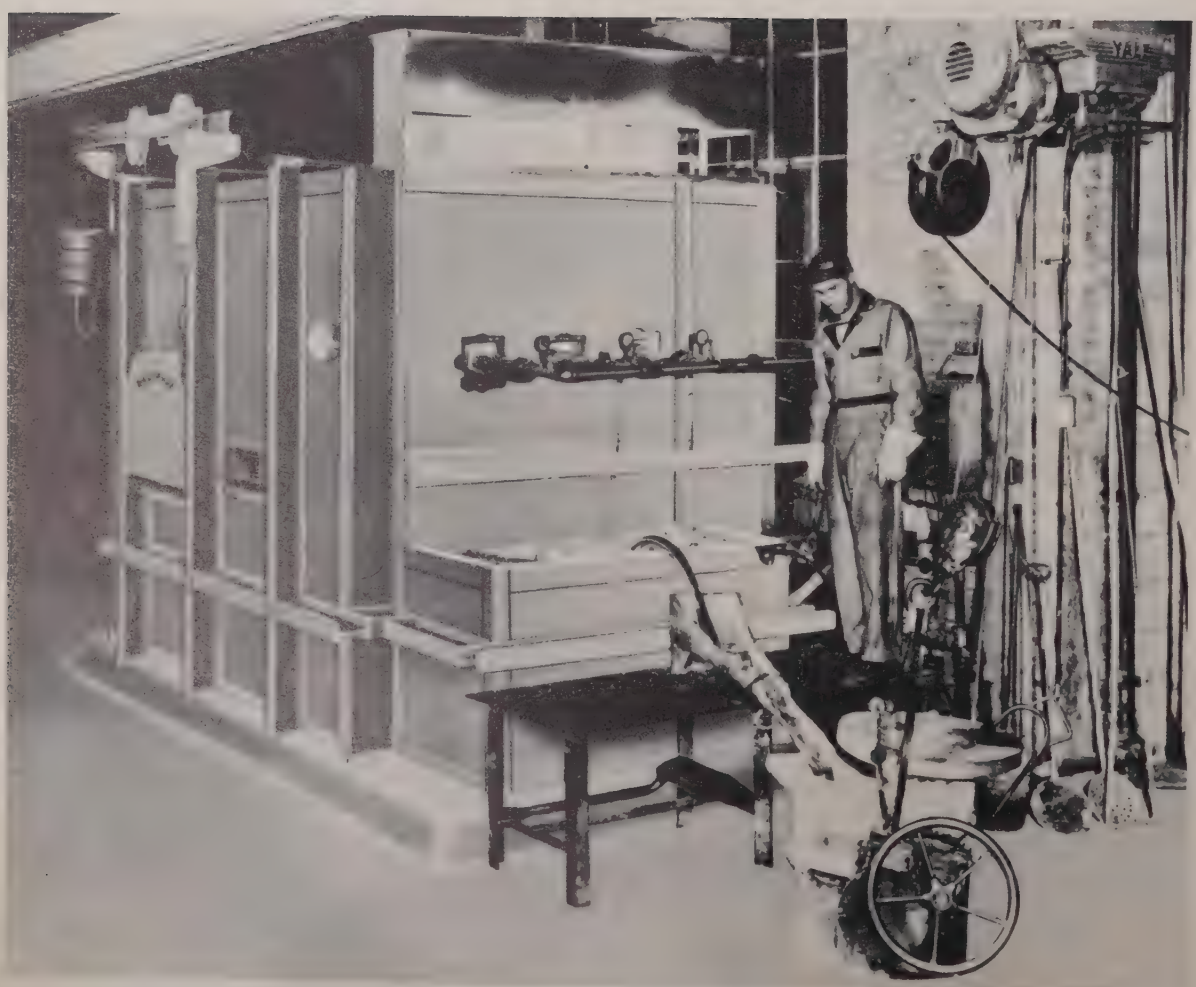


FIG. 1 - Gas fired reverberatory furnace of 18-ton capacity used for melting zinc base diecasting alloys.

Zinc Base Diecasting Alloys

Melting zinc base diecasting alloys in an 18-ton gas fired reverberatory furnace is described in this article. The furnace is reported to effect a reduction of 35 to 40 pct in direct labor and fuel costs, as compared with pot type units. Oxidation losses are said to range from 0.5 to 1 pct.

REVERBERATORY furnaces have been used for melting and alloying various metals for the past several hundred years. In fact, a detailed description of this type of melting furnace can be found in Biringuccio's "Pirotechnia" published in 1540.

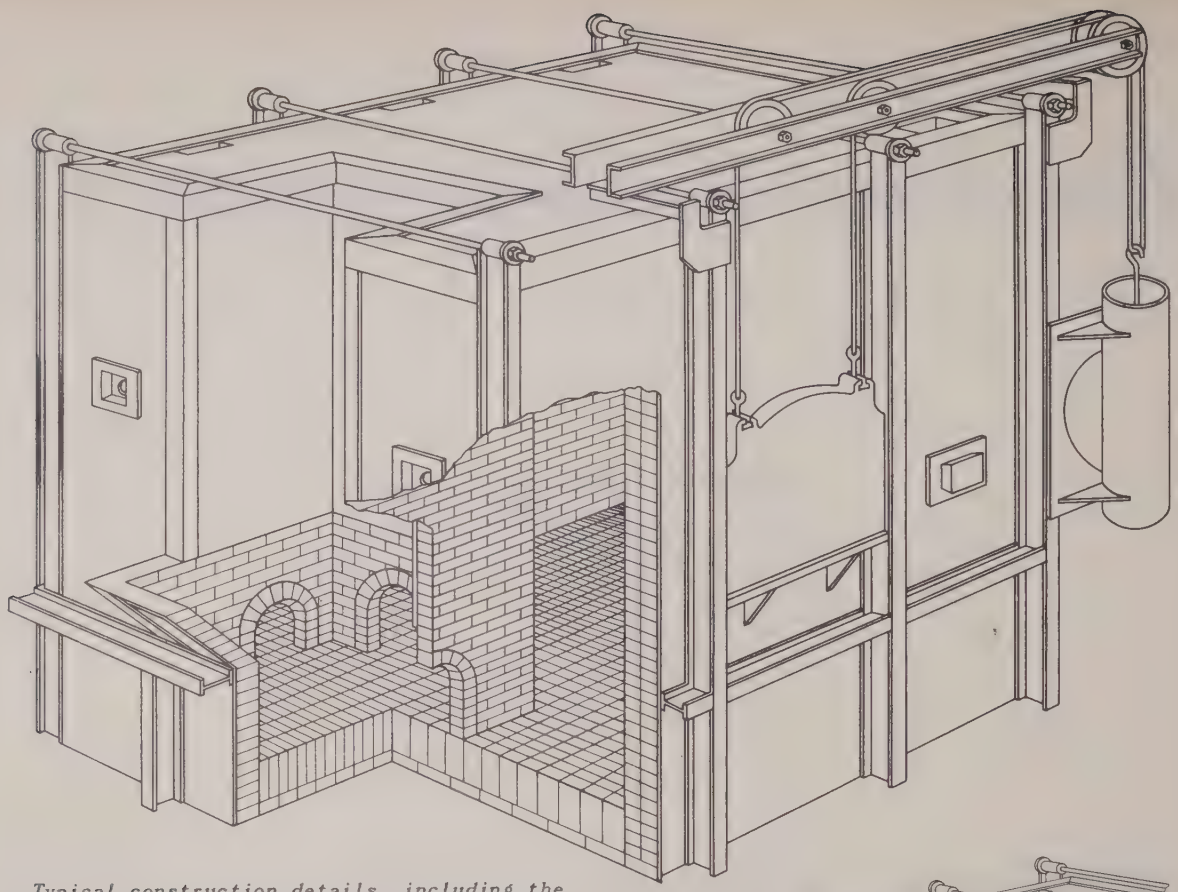
However, the use of reverberatory furnaces for melting and alloying zinc base die casting alloys is fairly recent. In the past die casters were of the opinion that this type of melting furnace could not be easily adapted to batch operation and that melting losses would be excessive.

Heretofore, melting and alloying of zinc base die casting alloys has been confined to oil or gas fired,cast iron, pot type furnaces having a capacity of 3000 to 7000 lb. While this type of melting furnace permits flexibility in charging and discharging and provides minimum oxidation loss, it has the disadvantage of requiring frequent replacement of expensive cast iron pots, inefficient utilization of fuel and loss of aluminum due to alloying with the iron from the pot.

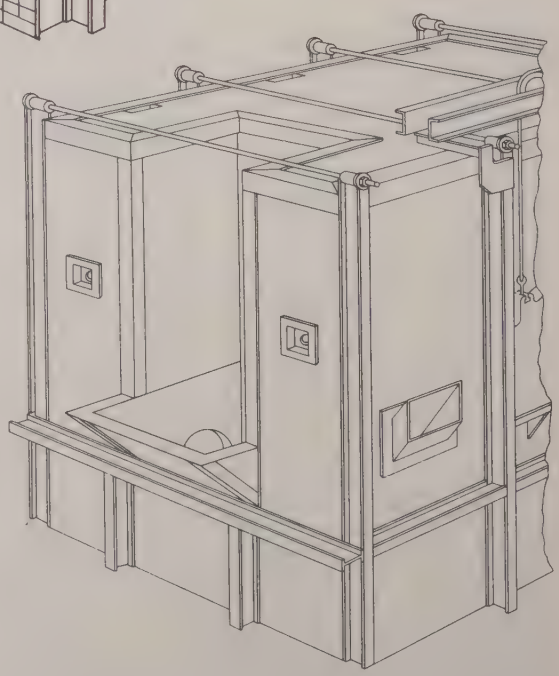
The 18-ton, gas fired reverberatory furnace shown in fig. 1 was designed and constructed by the Bellevue Industrial Furnace Co. for the specific purpose of melting and alloying zinc base die casting alloy at the Detroit Die Casting Div., Gerity-Michigan Corp. This furnace has the advantage of extended service life, more efficient fuel utilization, closer temperature control and no loss of aluminum due to alloying with iron from cast iron pots. Also, control of alloy composition is easier and analytical costs will be at a minimum, since one analysis will yield the composition of a larger quantity of alloy than can be alloyed in a conventional pot type furnace.

The design and construction of this furnace is illustrated by fig. 2, which represents a reverberatory furnace identical to that shown in fig. 1 with the exception of a slight modification of the pouring well design, which we have found to be desirable and which will be incorporated in future units.

It will be noted from the illustrations that the furnace is of very rugged construction. The casing, or shell, is fabricated of heavy steel plate securely welded and reinforced with structural steel shapes throughout. The refractory lining is of standard brick, the bottom being 14 in. thick, consisting of 9 in. thickness of a special refractory material backed up with 5 in. of insulating material. In the side walls up to 6 in. above the metal line, the walls are 18 in. thick, 9 in. of special refractory material backed up with two 4½ in. courses of insulating refractory and insulating brick. The upper part of the furnace walls above the metal line are 16 in. thick,



Typical construction details, including the interior brickwork, of a reverberatory furnace for melting zinc base diecasting alloys. This unit is identical with that shown in fig. 1, except for a modification of the pouring well.



made up of one 9 in. course of first quality firebrick backed up with 4½ in. of 2600°F insulating refractory and 2½ in. of 2000°F insulating brick. The arch is 13½ in. thick, 9 in. of first quality firebrick backed up with 4½ in. of insulating material. Gas burners are high pressure tunnel type manifolded together and brought to one point for connection to the control valve. A series of plugs are provided in the side walls with openings just above the metal line and vented through the side walls to the top. The plugs are provided with cleanout holes on the outside of the furnace.

Visible in fig. 2 is the charging slot on the side of the furnace which permits charging 40 to 60-lb zinc slabs without exposing the operator to direct furnace heat or possible splash from zinc slabs as they are lowered into the melt. The pouring well is provided primarily as a means of siphoning off metal as required, but this well can and is also used for charging molten aluminum alloy hardener and clean scrap such as gates and sprues.

Actual operation of the furnace is arranged so that charging and discharging are practically continuous with the production of 3000 to 4000 lb of zinc base diecasting alloy an hour. This compares with a melting rate of 2000 to 2500 lb of zinc base diecasting per hour for pot type furnaces. Oxidation losses range between 0.5 and 1.0 pct, depending upon the type of raw material charged, method of operation and control of furnace atmosphere.

Melting costs will vary from plant to plant, depending upon existing fuel and labor costs, but actual experience with the furnace design shown in fig. 1 indicates a cost saving, based upon direct labor and fuel costs, of 35 to 40 pct over similar costs for the conventional pot type melting.

Modern Heat Treating

A Reference Index

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THE literature on steel heat treating is extensive, but published information does not always agree. Work in the last 15 years has permitted systematization of heat treating, and from an art this fundamental process has grown into a science. Isothermal diagrams, indicating transformation-temperature-time relationships, have been plotted for more than 300 steels. Occasionally, photomicrographs have been superimposed on these diagrams to better illustrate the manner in which transformation proceeds at various temperatures. Isothermal diagrams have been drawn using dilatometric data, electrical resistance, and even welding data, in addition to metallographic methods.

The temperature at which unstable austenite will transform into martensite is calculated approximately from the chemical composition of the steel. The austenite-martensite transformation is independent of time.

Fig. I shows a typical TTT curve and the relation between it and various heat treatments. By

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cooling many steels to some 20° to 50°F above the Ms temperature, and holding there to equalize the temperature of the steel, stresses that cause cracking and distortion may be avoided. This procedure is widely used, although it may be limited by the size of the steels which may be so treated. Work is in progress to eliminate the trial and error experimentation now necessary.

Since TTT curves are determined under nearly ideal conditions and on very small thin metal samples, the indications of the curves are only approximate when it comes to practical heat treating. In actual operation, the piece does not cool instantly to the temperature desired and continuous cooling shifts the transformation-temperature-time relationship, the extent of which is a function of the cooling rate.

Table I is an index to references to modern heat treating. In addition to the effect of analysis and miscellaneous conditions, references are given to articles describing practical applications of TTT curves.

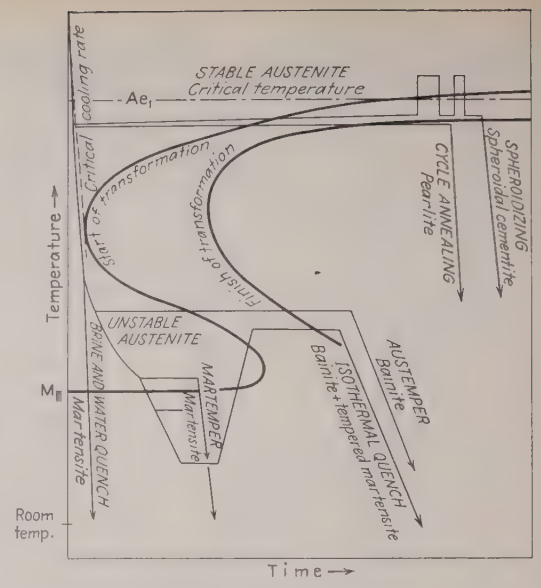

FIG. 1 - Schematic drawing of a typical TTT curve.

References

1. "Salt Baths for Forgings," THE IRON AGE, Newsfront, May 6, 1947.

2. "Isothermal Annealing of Forgings," THE IRON AGE, Jan. 1, 1948, p. 164; Steel, Jan. 12, 1948, p. 51.

3. "Austempering in Successful Commercial Operation," Heat Treating and Forging, October 1939, p. 499.

4. R. H. Aborn, "Metallurgical Changes at Welded Joints and the Weldability of Steel," Welding Journ., 19, 1940, p. 414-s.

5. C. R. Austin, "How Heat Treatments Affect High Strength Irons," American Machinist, 89, October 1945, p. 118.

6. C. R. Austin and J. R. Doig, "The Suppression of Pearlite in Mn-Mo Steels," Trans. ASM 36, 1946, p. 336.

7. J. B. Austin ad R. L. Rickett, Metals Tech. AIME, T.P. 964.

8. H. J. Babcock, "Salt Bath Quenching Processes," Metals & Alloys, 20, October 1944, p. 964; "Isothermal Quench Baths Applied to Commercial Practice," THE IRON AGE, Feb. 3, 1944, p. 44; Feb 10, 1944, p. 62; also Industrial Heating, August, 1946, p. 1288.

9. C. K. Baer, and A. E. Nehrenberg, "Practial Aspects of Bainitic Hardening of High-Speed Steel," THE IRON AGE, Sept. 4, 1947, p. 65.

10. C. K. Baer and P. Payson, "The Bainitic Hardening of High-Speed Steel," Trans. ASM, 39, 1947, p. 488.

11. J. R. Blanchard, R. M. Park and A. J. Herzig, "The Effect of Mo on the Isothermal Subcritical Transformation of Austenite in Eutectoid and Hypereutectoid Steels," Trans. ASM, 31, 1943, p. 849.

12. L. F. Bowne, "The Use of Direct Transformation Data in Determining Preheat and Postheat Requirements for Arc Welding Deep Hardening Steels and Weld Deposits," Welding Journ., 25, 1946, p. 234-s.

13. H. E. Boyer, "Controlling Physical Properties by the Interrupted Quench," THE IRON AGE, July 3, 1947, p. 47.

14. H. E. Boyer, "The Interrupted Quench and Its Practical Aspects," Trans. ASM, 38, 1947, p. 209.

15. O. E. Brown, "Modified Isothermal Treatments Minimize Distortion (on carburized SAE 3312)," THE IRON AGE, Apr. 17, 1947, p. 54.

16. W. H. Bruckner, "The Weldability of Steels," Welding Journ., 21, 1942, p. 55-s.

17. W. H. Bruckner and J. Hino, "The Rate of Spheroidization and the Physical Properties of Pearlitic Malleable Iron After Isothermal Quenching," Trans. AFA, 1944, p. 1189.

18. L. A. Carapella, "Computing A or Ms from Chemical Analysis," Metal Progress, June 1944, p. 108.

19. A. L. Christenson, E. C. Nelson and C. E. Jackson, "'S' Curves by Dilatometric Method," Trans. AIME, 162, 1945, p. 614.

20. Climax Molybdenum Co., "Mo, Fundamental Effects in Steel," 1st and 2nd Editions.

21. M. Cohen and P. Gordon, "Heat Treatment of High-Speed Steel," THE IRON AGE, Feb. 28, 1946, p. 42; Mar. 7, p. 52; Mar. 14, p. 68; Mar. 21, p. 61; and Mar. 28, p. 55.

22. A. Cottrell, "Tensile Properties of Unstable Austenite and Its Low Temperature Decomposition Products (Ni-Cr-Mo Steel)," Journ. Iron and Steel Inst., 1945 (I), Vol. 151, 93 p.

23. P. A. Cushman, "Isothermal Heat Treatment Aids Bearing Production," THE IRON AGE, Nov. 27, 1947, p. 76.

24. E. S. Davenport, "Isothermal Transformation in Steels," Trans. ASM, 27, 1939, p. 837. (Extensive bibliography 1919 to 1939).

25. E. S. Davenport, R. A. Grange and R. J. Hafsten, "Influence of Austenite Grain Size Upon Isothermal Behavior of SAE 4140 Steel," Trans. AIME, 145, 1941, p. 301.

26. G. Delbart and R. Potaszkin, "Properties of Cr-Mo Steel," Rev. de Metallurgie, 43, 1945, p. 84.

27. G. Delbart and R. Potaszkin, "The Mechanical Properties of a Ni-Cr-Mo Steel Obtained by Stepped Quenching," Journ. of the Iron and Steel Inst., 157, 1947, p. 527.

28. J. P. Deringer, "Bearing Races Improved by Isothermal Treatment (SAE 52100)," Metal Progress, July 1945, p. 80.

29. C. W. Dietz, "Short Anneal for Carburized SAE 3312," Metal Progress, December 1943, p. 1097.

30. R. M. Ellis, "Isothermal Treatment for Pistol Parts," THE IRON AGE, Feb. 8, 1945, p. 42.

31. M. L. Frey, "Timed Quenching;" B. F. Shepherd, "Martempering;" H. J. Elmendorf, "Hot Quenching and Austempering;" "Incomplete Quenches: A Discussion," Metal Progress, August 1944, p. 308.

32. R. A. Grange and J. M. Kiefer, "Transformation of Austenite on Continuous Cooling and Its Relation to Transformation at Constant Temperature," Trans. ASM, 29, 1941, p. 85.

32b. R. A. Grange and H. M. Stewart, "The Temperature Range of Martensite Formation," Trans. AIME, T.P. No. 1996, Metals Tech., June 1946; Steel, May 2, 1946, p. 126; Metal Progress D.S., October 1946, p. 676-B; Materials & Methods, June 1946, p. 1621.

33. W. T. Griffith, L. B. Pfeil and N. P. Allen, "Intermediate Transformation in Alloy Steels," Metal Progress, August 1939, p. 158.

34. M. Grossman, "Principles of Heat Treating," ASM book.

35. R. J. Hafsten, "Metallurgy of SAE 52100 Ball Bearing Steel," THE IRON AGE, July 5, 1945, p. 54.

36. W. F. Hess, "Effect of Cooling Rate on the Properties of Arc Welded Joints in C-Mo Steel," Welding Journ., 21, 1942, p. 608-s.

37. W. F. Hess, W. D. Doty and W. J. Childs, "The Heat Treatment of Spot Welds in Steel Plate," Welding Journ., 26, 1947, p. 641-s.

38. W. F. Hess, L. L. Merrill, E. F. Nipper and A. P. Bunk, "The Measurement of Cooling Rates Associated with Arc Welding and Their Application to the Selection of Optimum Welding Conditions," Welding Journ., 22, 1943, p. 377-s.

39. J. H. Hollomon and L. D. Jaffe, "Ferrous Metallurgical Design," John Wiley & Sons, Inc., N. Y., 1947, p. 230, p. 270.

40. "Equal Hardness with Salt Quench," Houghton Line, vol. 15, February 1947, p. 11.

41. R. T. Howard and M. Cohen, "Austenite Transformation Above and Within the Martensite Range," Trans. AIME, T.P. 2288, Metals Tech., vol. 14, September 1947.

42. S. I. Hoyt, C. E. Sims and H. M. Banta, "Improving the Weldability of High Strength Low Alloy Steels," THE

IRON AGE, vol. 155, 1945; May 31, p. 38; June 7, p. 70 and June 14, p. 74.

43. A. Hultgren, "Isothermal Transformation of Austenite," Trans. ASM, 39, 1947, p. 915.

44. International Nickel Co., "Isothermal Transformation Diagrams for Ni Alloy Steels," Nickel Alloy Steels, Section 5, Data Sheet A, 1947.

45. B. K. Inatov, "Effect of Chemical Elements on the Isothermal Decomposition of Supercooled Austenite (in cast iron) for Piston Rings," Chemical Abstracts, 40, 1946, p. 4997.

46. L. D. Jaffe, "Anisothermal Formation of Bainite and Proeutectoid Constituents in Steel," Trans. AIME, T.P. No. 2290, Metals Tech., December 1947.

47. A. H. Koch, "Gas Furnaces for Interrupted Quenching," Metal Progress, May 1945, p. 921.

48. E. E. Legge, "The Industrial Application of Austempering," Metals & Alloys, August 1939, p. 228.

49. C. H. Lekberg, "Interrupted Quenching as a Metallurgical Tool," Steel, Oct. 27, 1947, p. 79.

50. C. H. Lekberg, "Modern Methods for Interrupted Quenching," Industrial Heating, October 1946, p. 1591.

51. C. A. Liedholm, "Experimental Studies of Continuous Cooling Transformations," Trans. ASM, 38, 1947, p. 180.

52. C. A. Liedholm and W. C. Coons, "Effect of Annealing Cycles on Cooling Transformations Upon Subsequent Isothermal Reactions," Metal Progress, January 1946, p. 104.

53. E. A. Loria and H. D. Shephard, "Acicular Transformations in Alloy Steels," Trans. ASM, 1948, vol. 40, Prep. No. 9, p. 758.

54. T. Lyman and A. R. Troiano, "Isothermal Transformation of Austenite in 1 Pct Carbon High Chromium Steels," Trans. AIME, T.P. 1801, Metals Tech., September 1945.

55. F. J. McMulkin, "Practical Tool Room Heat Treatment," THE IRON AGE, 1946, June 6, p. 60; June 13, p. 56; June 20, p. 64; June 27, p. 55.

56. A. W. McReynolds, "Electrical Observations of the Austenite-Martensite Transformation in Steel," Journ. Applied Physics, 17, 1946, p. 823.

57. R. J. Marcotte and C. T. Eddy, "The Effect of Homogenization of Cast Steels," Trans. ASM, Vol. 40, 1948, Prep. No. 30, p. 649.

58. G. K. Manning and C. H. Lorig, "The Relationship Between Transformation at Constant Temperature and Transformation During Cooling," Trans. AIME, T.P. 2014, Metals Tech., June 1946.

59. Metallurgicus, "Cycle Annealing," (Steels. 3130, 3240, 3312, 4042, 4130, 4150, 4320, 4640, 52100, 6150, 8620, 9260), Metal Progress, March 1944, p. 508.

60. F. R. Morral, "Heat Treating Diagrams" (192 alloys indexed in 5 major groups, summary of factors affecting transformation rates, etc., more than 28 ref.), Metal Progress, October 1945, p. 818. New Compilation of Isothermal Diagrams (329 alloys—364 curves in 4 groups, 68 ref.), in preparation.

61. C. Nagler and R. L. Dowdell, "Isothermal Transformation of Mo Cast Iron," AFA Prep. 47-17, 1947.

62. T. F. O'Brien, "Heat Treatment of Steel, "Metals & Alloys, May 1945.

63. C. W. Ohly, "Austempered Cast Iron Serves as Cylinder Liners," Materials & Methods, May 1947, p. 89.

64. W. Olson and G. Nevins, "Use of Modified Martempering for Hardening Intricately Shaped Dies," Steel, Dec. 15, 1947, p. 88.

65. P. Payson, "The Annealing of Steel," THE IRON AGE, June and July 1943.

65b. P. Payson, W. L. Hodapp and J. Leeder, "The Spheroidizing of Steel," Trans. ASM, 1939, p. 306.

66. P. Payson and J. L. Klein, "The Hardening of Tool Steels," Trans. ASM, 1943, p. 218.

67. P. Payson and C. H. Savage, "Martensite Reactions in Alloy Steels," Trans. ASM, 33, 1944, p. 261.

68. P. Peter, "Cooling Power of Quenching Liquids and Influence on Hardening Processes," K. Wilhelm Inst. f. Eisenforschung, 1946, Manuscript No. 63.

69. M. A. Pugacz, G. J. Siegel and J. O. Mack, "The Effect of Postheat in Welding Medium Alloy Steels," Welding Journ. 23, 1944, p. 536-s. (By welding method gets "S" curves similar to those obtained by conventional methods—Steels X4130, 8630, 9480, 4140, 4340, 2340, 6140, 4615, 4640, 8140, 1335, 9442 and others.)

70. G. A. Roberts and R. F. Mehl, "Effect of Inhomogeneity in Austenite on the Rate of the Austenite Pearlite Reaction in Plain Carbon Steels," Trans. AIME, T.P. No. 1568, 1943.

71. K. Rose, "Cyclic Annealing of Steel Forgings Saves Time, Betters Quality," Materials & Methods, January 1948, p. 71.

72. D. Rosenblatt, "How to Predict Suitability and Determine Method of Martempering Hypo-Eutectoid Steel," Steel, 121, Oct. 20, 1947, p. 121.

73. E. S. Rowland and R. S. Lyle, "Measurement of Case Depths by Martensite Formation," Metal Progress, May 1945, p. 907.

74. J. V. Russell, and F. T. McGuire, "A Metallographic Study of the Decomposition of Austenite in Mn Steels," Trans. ASM, 33, 1944, p. 103.

75. A. P. Seasholtz, "Interrupted Quenching in Salt Baths," Metal Progress, October 1944, p. 730.

76. L. J. Sheehan, "Salt Bath Hardening of NE Steels," Metals & Alloys, November 1943.

77. B. F. Shepherd, "Mechanical and Metallurgical Advantages of Martempering Steel" Product Enginering, July 1945, p. 438.

78. B. F. Shepherd, "Martempering Steel—Limitations of Hardness Penetration," Product Engineering, August 1945, p. 515.

79. A. L. Simmons, "The 'S' Curve and Its Significance in the Practical Heat Treatment of Steel," The Australasian Eng. Science Sheet, June 7, 1944, p. 2. (A General review; 70 references).

80. B. Thomas, "Salt Bath Quenching," Heat Treating and Forging, 20, 1934, p. 285.

81. F. C. Thompson and L. R. Stanton, "The Effect of Oxygen on the Isothermal Transformation of Steel and Suggested Test for Burning," Journ. Iron and Steel Inst., 1946, (I) vol. 153, p. 259.

82. F. C. Thompson and L. R. Stanton, "Some Observations on the Austempering and Isothermal Transformation of Steels, With Special Reference to the Production of Martensite," Iron and Steel Inst. Journ., 1945 (I), vol. 151, p. 133; abstracted in Industrial Heating, July 1947, p. 1110. (70 references).

83. J. M. Thompson, "Impact Resistance v. Hardness of Aircraft Low Alloy Steels," THE IRON AGE, Mar. 8, 1945, p. 72 (SAE 4130, 4140 and X4340).

84. A. R. Troiano and A. B. Greninger, "The Martensite Transformation," Metal Progress, August 1946, p. 303.

85. U. S. Steel Corp., "Suiting the Heat Treatment to the Job," 1946.

86. U. S. Steel Corp., "Atlas of Isothermal Transformation Diagrams," 1943.

87. F. Wever, and K. Mathieu, "On Transformations in Mn Steels," Mitt. K. Wilhelm Inst. f. Eisenhuttenw. 22, 1940, p. 9.

88. K. Winterton, "The Effect of Overheating on the Transformation Characteristics of a Ni-Cr-Mo Steel," Journ. Iron and Steel Inst., 1945 (I), vol. 151, p. 79.

89. I. N. Zavarine, "Initial Stages of the Magnetic and Austenite Transformation in Carbon Steels," Trans. AIME, T.P. No. 646, Metals Tech., October 1935.

90. C. Zener, "Kinetics of the Decomposition of Austenite," Trans. AIME, T.P. No. 1925, 1945.

91. D. J. Mack, "The Isothermal Transformation of an Eutectoid Aluminum Bronze," Trans. AIME, T.P., No. 2242, 1947.

92. D. B. Oakley and J. F. Oesterle, "Dilatometric Studies in the Transformation of Austenite in Molybdenum Cast Irons," Trans. ASM, 1940, p. 832.

93. R. W. Lindsay, and J. E. Atherton, "Heat Treatment Study of Pearlite Malleable Cast Iron," American Foundryman, September 1945, p. 27.

94. G. Sachs, L. J. Ebert and W. F. Brown, "Notch Tensile Characteristics of a Partially Austempered Low Alloy Steel," AIME, T.P. 2321, Metal Tech., February 1948.

95. B. L. Averbach and M. Cohen, "X-ray Determinations of Retained Austenite by Integrated Intensities," AIME, T.P. 2342, Metal Tech., February 1948.

96. W. E. Bancroft, "Salt Baths for Hardening High Speed Steel," Metal Progress, 50, 1946, p. 941.

97. H. Lawrence, "Weldability in Steel," 110, Jan. 26, 1942, p. 90.

98. W. F. Toerge, "An Evaluation of Boron Treated Steels," THE IRON AGE, Dec. 8, 1947, p. 93.

99. C. A. Liedholm, A. I. Rush and W. C. Coons, (SAE 6115); Metal Progress, March 1948, p. 392-B.

100. D. K. Bullens, "Steel and Its Heat Treatment," John Wiley & Sons, 1948, vol. Principles, p. 311-331, and others; vol. II, p. 274.

101. D. W. Rudorff, abstract of A. Gulyaev's Russian article on the influence of Mo content upon the properties of high speed W free tool steel, Metallurgia, July 1941, p. 88.

102. E. S. Davenport, "Program in the Heat Treatment of Steel," Scientific American, April 1948, p. 149.

103. W. E. Bancroft and W. W. Wight, "The Practical Heat Treatment of High Speed Steel Cutting Tools," Metal Progress, April 1948, p. 545.

104. C. K. Donoho, "The Temperature Range of Martensite Formation," Metal Progress Data Sheet, October 1946, p. 676-B.

105. W. J. Harris, "Comparison of Metallographic and X-ray Measurements of Retained Austenite," Nature, London, Feb. 28, 1948, p. 315.

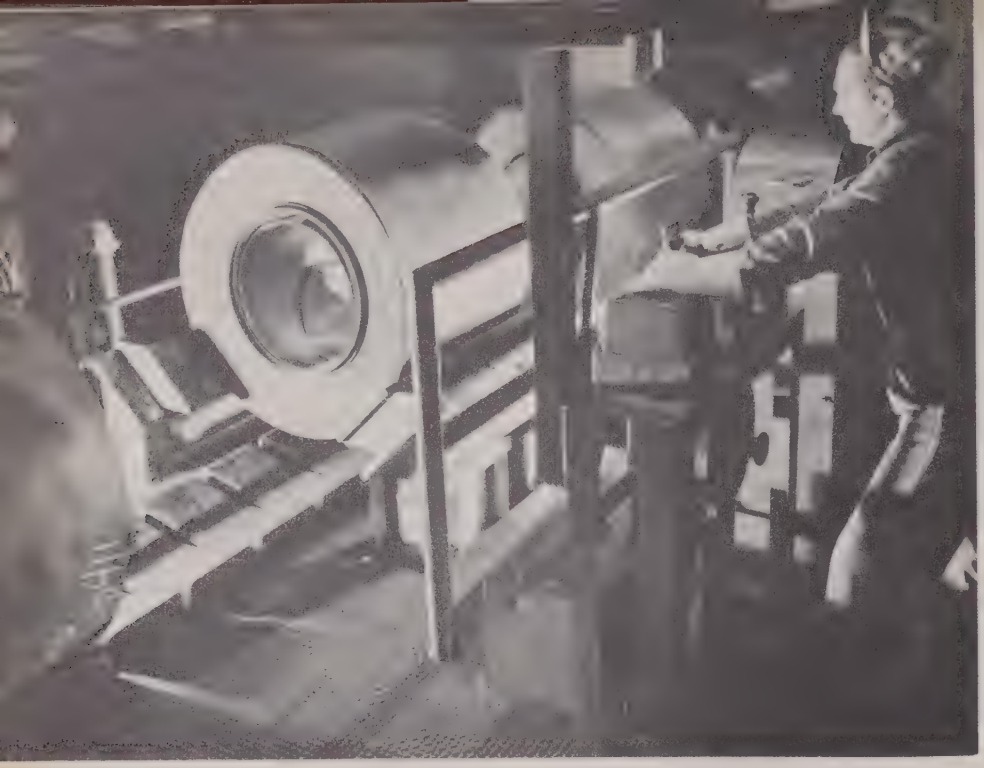

FIG. 1 - V-top conveyer and automatic scale at entry end of continuous pickling line. Scale lifts the coil from the conveyer, weight is stamped on a production card and the coil is moved on to a scale breaker.

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Conveyer System Simplifies

By C. F. SEYLER
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Jones & Laughlin Steel Corp.,
Pittsburgh

A PALLET type conveyer system, designed to prevent telescoping and to hold coil damage to a minimum, is used to feed a continuous pickling line and the new 5-stand tandem mill, fastest cold rolling mill in the industry, at the Aliquippa Works of Jones & Laughlin Steel Corp., Pittsburgh.

Instead of skidding coils endwise on roller type conveyers as in the past, movement is effected by what is said to be the heaviest pallet type conveyer system ever built for handling steel coils. The conveyers, shown in fig. 1, were built by Link Belt Co.

Prevention of production-snarling edge damage is a primary consideration throughout the installation, and has been followed through to the elimination of side guides in the processing machinery on the production line.

Another feature of the system is its development of the use of the slow moving hydraulic pushoff to give smooth operation in the transfer

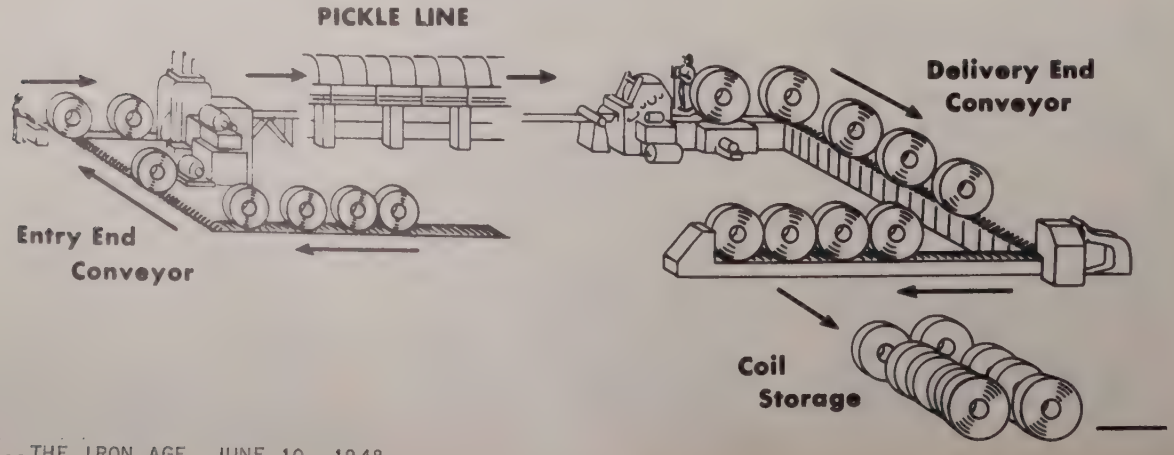


FIG. 3 - At delivery end of the continuous pickling line, coils from the upcoiler are rolled onto a cradle hoist for weighing, right rear, and are then rolled onto the V-top conveyer and carried to the hydraulic pushoff in the foreground which starts them to storage on a flattop conveyer.

• • •

Coil Handling at Aliquippa

Use of a specially engineered pallet type conveyer system to handle steel coils weighing up to 30,000 lb at the Jones & Laughlin Aliquippa Works is described in this article. Designed to minimize coil edge damage in feeding a continuous pickling line and rolling mill, the system also incorporates automatic weighing devices, an interesting system for starting coils into the mill and other features. Special units used at two points on the continuous pickling line to facilitate scrap removal are described.

of coils at the entry end and at the delivery end of the continuous pickle line.

Coils of hot-rolled strip entering the line are carried from storage as in the flow sheet in fig. 2, to a flat top conveyer which feeds them at right angles into a V-top conveyer. On their way to the entry end scale breaker, the coils are weighed by a lifting apparatus shown in fig. 1, designed to take coils of varying diameter.

Opposite the scale breaker a slow moving hydraulic pushoff moves the coil onto a dolly car. Speed of the pushoff is regulated by a con-

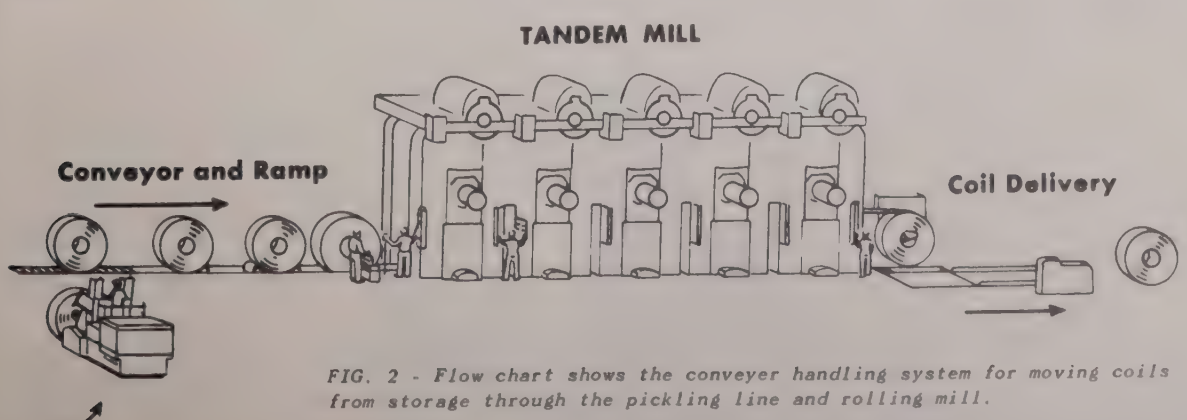


FIG. 2 - Flow chart shows the conveyer handling system for moving coils from storage through the pickling line and rolling mill.

FIG. 4 - Sheet of scrap steel sheared from coil by the upcut shear in the background is being thrown onto a scrap removing car by a tilting table mechanism.

stant delivery oil system so that there is no violent motion.

The dolly car, a hydraulically operated spinning roll cradle on a hoist cylinder, carries the coil from the conveyer to the scale breaker, and positions the coil for quick mounting before the preceding coil has left the mandrel.

A safety feature of this movement is a flexible disappearing platform, consisting of a wide pallet conveyer mechanism, which is pulled out from the entry end feeder to provide working support.

The steel strip is processed through the scale breaker and other entry end units without the use of side guides, riding between units on conveyer tables with rollers.

Similar tables are used to support the strip as it emerges from the pickling tanks and is processed through units at the delivery end of the line. After the treated strip is coiled on an upcoiler, it is rolled onto a spinner roll cradle hoist mounted on a scale, fig. 3. This arrangement tightens the coil, facilitates banding, and at the same time weighs the coil.

A mechanically depressing roller allows the coil to roll onto a V-top cross conveyer which carries it to a right angle intersection with a flattop conveyer feeding into a storage area.

At the intersection, the coil is shoved from one conveyer to the other by a second hydraulic pushoff, seen in fig. 3. Because the coils which enter the line weigh only 6000 to 7000 lb, and the coils at the delivery end weigh up to 30,000 lb, having considerably greater coil diameter, special care in handling is necessary at this point.

An especially rugged and massive pushoff was designed. Its motion is slow and steady to prevent any possibility of coil rocking. The pushoff control is interlocked with control of the conveyer electrically, so that it cannot be operated while the conveyer is in motion. A heavily constructed safety stop also is interlocked with the conveyer to prevent conveyer motion if a coil should move against it.

Devices at two points on the continuous pickle line have simplified scrap handling problems. At the upcut shear on the entry end, a special tilting table arrangement, shown in fig. 4, throws scrap sheets and fishtails from the conveyer tables onto a specially designed car for bundling scrap.

When the car is loaded, the scrap is conveniently banded and carried to an automatic bundle stripping cradle in the storage area of the mill where it is held until carried away by crane.

The result of this arrangement is to prevent scrap from cluttering operations and to facilitate its removal. Similar results have been obtained at the delivery end of the pickle line in the disposal of scrap from a side trimmer.

Scrap from the trimmer is carried away during operation and balled on a scrap balling machine which has straight line operation—the scrap enters one side, is balled on a mandrel and is kicked out for removal on the opposite side of the machine.

The roller which compacts the ball weighs 4 tons. The mandrel plunger and the kickout arms are interlocked hydraulically to prevent the plunger from hitting the sides of the arms. Balls of scrap are removed by crane.

As shown in the flow sheet in fig. 2, steel coils from the storage area opposite the delivery end of the pickle line are carried to the 5-stand tandem mill by 30,000-lb capacity ram trucks, fig. 5, and placed on a feed-in pallet conveyer.

This conveyer carries the coil to a ramp where it rolls into a ready position held by a hydraulically operated stop, shown in fig. 6. When the stop is depressed, the coil rolls into a spinning roll cradle consisting of one driven roll and an idler roll.

The spinner rolls tighten the coil, permit removal of the band, and allow the coil to be prepared and positioned to enter the coil box.

FIG. 5 - Trucks with 30,000 lb capacities are used to carry steel coils to entry end of the rolling mill where a flattop conveyer line feeds the entry coil box.

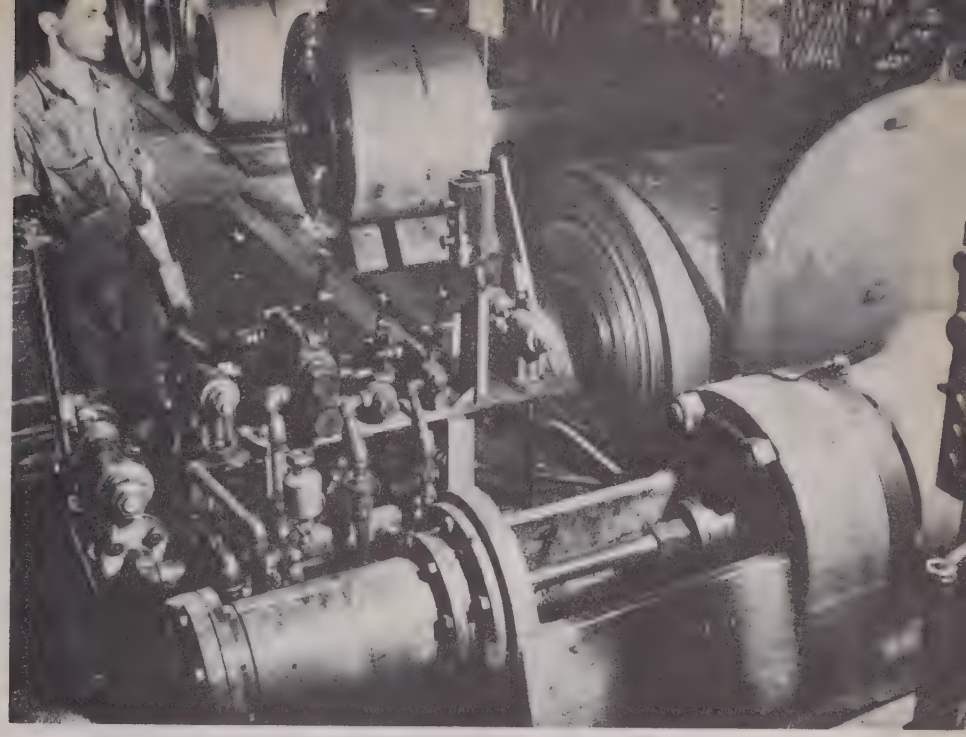


FIG. 6 - Coils are being fed down the ramp to spinner rolls, one idler and one driven roll, which permit the operator to remove the band and flatten the tail of the coil for feeding into the tandem mill.

• • •

The back roller, which is the idler, raises hydraulically to kick out the coil onto the coil box hoist as the preceding coil leaves the box.

This hoist consists of two idler rolls, hydraulically operated, which lift the coil into position between the circular bronze faced flanges of the coil box.

Retractable shafts in the center of the flanges assist in positioning the coil to the center of the mill. The hoist is temporarily lowered, the flanges align the coil, then the hoist is raised again and the shafts are retracted.

When the mill is rolling at operating speeds, the coil is resting on the idler rolls of the hoist and not on the shafts, as in fig. 7. In this way the edges of the coils are preserved from damage.

At the delivery end of the tandem mill, a belt wrapper wraps around the tension reel collapsing block to enable the strip to be started on the reel. On completion of the coil, the block is collapsed and a stripper pushes it off the block onto a car hoist platform.

This platform carries the coil to a position from which it is kicked off down a gradually sloping ramp, where weight of the coil is automatically registered.

• • •

FIG. 7 - Coil is being fed from the coil box into the rolling mill. Coil rests on idler rolls of the coil box hoist, and not on the shafts, in order to prevent strip edge damage.

. . Annual dinner at the 56th general meeting of the American Iron & Steel Institute, held on May 27, at the Waldorf-Astoria in New York.

Steel Heads See Government Shadow on Industry

FOB mill base means local steel monopolies, Tower tells AISI meeting . . . GM wage rise credited to research improvements, Kettering explains . . . Mauthe and Fetters of Youngstown awarded institute medal . . . Oxygen, low carbon stainless, raw material problems highlight technical meetings.

STEELMAKERS gathered late last month for their usual annual meeting under the usual shadow of government interference. But this year in the meeting rooms, halls and suites there was an acute consciousness of that lengthening shadow. President Walter Tower, who keynoted the 56th general meeting of the American Iron & Steel Institute, May 26 and 27, put his finger on that feeling. The steel industry is big. "It takes no expert marksman to hit a barn with a blunderbus," he declared. The capacity wrangle was dumped out of last year's first place in favor of the basing point enigma.

Up and down the halls of New York's Waldorf-Astoria and on into the night the basing point discussions raged. Nothing was agreed upon except that any switch from the multiple basing point system would be bad. Few doubted but that the change was coming unless headed off in Congress but agreement on how an f.o.b. mill system would work in practice was not unanimous. Ways and means of operating under such a setup were advanced, tossed about and rejected. One thing was certain: There will have to be more specific information forthcoming from Washington before the confusion now clouding the minds of the industry's leaders on this question is cleared up.

The General Motors wage settlement astonished many of the steel producers. Little was said publicly, but an undertone of resentment—a feeling they had been double-crossed—was obvious. Many of the leaders present at the Waldorf had followed U. S. Steel's price cut lead—a sincere attempt to check rising costs. These men knew they were afloat in a frail craft on the sea of inflation. In the men's bar one remarked that the GM settlement had pulled the plug from their boat and that it would take a whale of a lot of bailing to keep the craft afloat now.

Charles F. Kettering, research consultant and a director of General Motors Corps., led off the meeting with the Schwab Memorial Lecture. He complimented the steel industry on its research work in the past but warned against laying down on the job. Mr. Kettering also told how research had been tied into the latest GM wage settlement. C. E. Wilson, GM president had asked him how much he could improve things each year by engineering or process improvement and Mr. Kettering said he agreed he could gamble on 2 pct a year. That, he said, is how they figured they could give GM workers a regular 3¢ per hr wage boost each year. Mr. Kettering also repeated his thesis that human progress is not static and that opportunities today are unlimited.

Walter Tower complimented the steel producers on their outstanding 1947 record, calling it an indication of what the industry could do if allowed to produce without interference. He pointed to the attacks being directed at the industry on the grounds it was heading the nation into another inflationary whirl despite its opposite

TOPS - Steel industry leaders pose for a photo at the 56th general meeting of the American Iron & Steel Institute. Left to right, Walter S. Tower, reelected president of the institute, Charles F. Kettering, Schwab Memorial Lecturer, Eugene G. Grace, Bethlehem Steel Corp. chairman, and Benjamin F. Fairless, president, U.S. Steel Corp.

policy. He touched on the capacity question and countered with the 5 million tons of new capacity installed or planned since the war's end. He cited its $300 a ton cost, and remarked that while 1947 shipments were 40 pct above those in 1929 profits were less, and in terms of 1947 buying power only half as good.

Mr. Tower cautioned his listeners against the passing appeal in the idea of having government regulation as a shield between producers and a hardy array of insatiable buyers. Priorities shouldn't be necessary, he averred, in a peacetime economy when management is able and courageous. The cement industry basing point decision came in for criticism by the institute head. Few of the automobiles, washing machines and refrigerators that today are part of our standard of living are made at basing points or even close to steel mills. These products grew in importance, he asserted, when steel products generally were sold on the basing point method of pricing. Its end would mean local steel monopolies and penalties to buyers, Mr. Tower asserted.

Dr. Claude S. Robinson, president of Opinion Research Corp., Princeton, N. J., predicted that business men will spend more time, energy, money and imagination on public relations in the future than they have in the past. The capitalistic system is just as strong as the public's faith in it, he declared. "Industry has a lot of know-how in merchandising its products. It is just now beginning to get a real hold on the technique of merchandising leadership," he concluded.

J. L. Mauthe, vice-president, and Karl L. Fetters, special metallurgist, Youngstown Sheet & Tube Co., were two of the winners of the American Iron & Steel Institute Medal. The award was for their 1947 institute paper, "The Mineralogy of Basic Openhearth Slags." The medal for the third winner, the late, J. H. Slater, who was assistant district manager, Cleveland district, Republic Steel Corp. at the time of his death, was received by his two sons, Joseph L., and William A. Slater. The award was for a paper titled "Operation of the Iron Blast Furnace at High Pressure."

For other details of the institute meeting see THE IRON AGE, June 3, p. 123.

Oxygen Experience Discussed

The technical sessions of the institute meeting explored a variety of material and operating problems, including coke and coal supplies, oxygen in steelmaking, sources of iron units, refractories, speciality steels, and coating and finishing.

Oxygen in steelmaking came in for its share of attention with the presentation of three papers, "Tonnage Oxygen for Increased Iron and Steel Production," by J. H. Strassburger, Weirton Steel Co.; "Some Practical Aspects of Direct Oxidation in the Basic Open Hearth Process," by F. G. Norris and E. B. Hughes, Wheeling Steel Corp.; and "Use of Oxygen for Decarburization and Melting in Electric Furnaces," by J. H. Eisaman, Carnegie-Illinois Steel Corp.

The paper by Strassburger of Weirton Steel was of particular interest in that it discussed

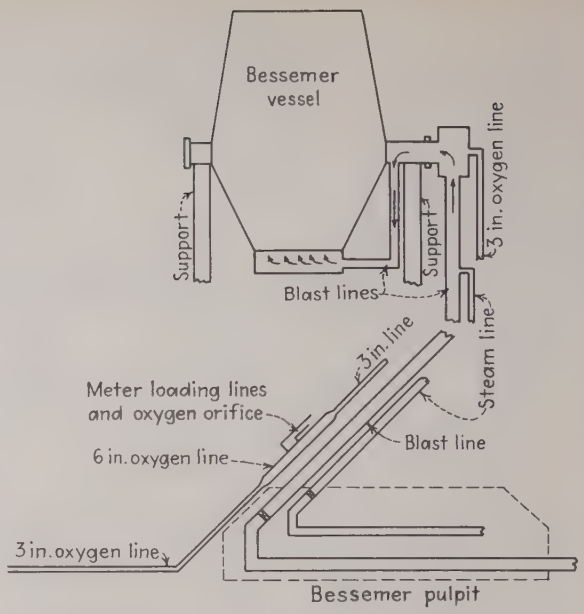


FIG. 1 - Piping arrangement used at Weirton Steel Co. in conjunction with experiments with oxygen on the bessemer converter. Valves on blast, steam and oxygen are all hand operated.

the company's plans for the new 400-ton per day tonnage oxygen plant now being built and also for the data the paper included on the experimental use of oxygen in the bessemer converter. The oxygen piping was installed, Strassburger reported, so that it went through the bessemer converter control house where a hand-operated quick opening valve was located for easy control by the bessemer blower. The piping after the control valve paralleled the regular air blast piping to the converter connecting into the air blast close to the trunnions with a perforated distribution pipe inside of the air main. Fig. 1 shows diagrammatically this arrangement of piping with control valves and metering. The oxygen pressure at the converter was approximately 20 psi.

The oxygen was turned on with the blast as the converter was being rotated upwards at the start of the heat and in the first series of experiments the oxygen was left on during the silicon and carbon blows until the scrap was melted. The color of the flame was different than with air and was characterized by an intense, white glare. In the first experimental heats additional scrap amounting to 20 pct more than normal was charged and the blown metal produced was entirely satisfactory for the openhearth department.

The average data on these oxygen heats showed a decrease of 25 pct in blowing time as compared with normal practice and an increase in production of 37.5 pct in tons of blown metal produced per min, including a 20 pct increase in scrap charge. This performance was obtained with only 258 cu ft of oxygen per ton of blown metal as compared with the German practice of 800 to 850 cu ft oxygen per ton where ample oxygen was available for full scale use.

Experiments were then made by introducing the oxygen for about 2½ min after the scrap was melted with no oxygen used during the scrap melt in an effort to lower the final silicon and

possibly obtain an improved blown metal. As a result of this work, a final series of tests were made with the oxygen in the bessemer for 3 to 4 min during the scrap melting period and 1 to 2 min at half rate after the carbon blow for final reduction of silicon. These heats were made with a normal scrap charge approximately the same as when blowing air. The results of this series of tests indicate a decrease of 29.5 pct in blowing time and over a 40 pct increase in tons of blown metal produced per minute with 216 cu ft of oxygen used per ton. The oxygen was turned on at the start of all blows for 3 to 4 min until the scrap was melted with an oxygen rate of 1600 cfm and after the carbon blow the oxygen was again turned on for 1 to 2 min at half rate of 800 cfm in order to obtain final silicon reduction. The results of this practice showed an exceptionally good quality of blown metal with a clean, white, hot iron and very good slag separation. The silicon was reduced from a normal of 0.010 to 0.006 pct.

Earle C. Smith, chief metallurgist, Republic Steel Corp., Cleveland, touched upon the possibilities offered by the use of oxygen in the direct reduction of ore in the openhearth. In his presentation entitled "Experience to Date on Iron Production by Methods Other Than Coke Blast Furnace; Direct Reduction," the author stated that the ability to use oxygen in large amounts in the openhearth increases the sharpness of furnace operation and permits the openhearth melter to safely risk much more ore as charge ore.

Low Carbon Stainless

Due to the improvements in melting practices, availability of purer raw materials and controlled processing, it is now commercially possible to manufacture chromium-nickel stainless steels containing 0.03 pct, or less, max C. Assuming that the less carbon present in the steel the less degree of metallic carbide precipitation and, consequently, the greater the degree of freedom from intergranular corrosion, there is considerable interest in the behavior of these particular grades of steels.

This factor of reduced carbon content was investigated by George C. Kiefer and Claude M. Sheridan, associate directors of research, Allegheny Ludlum Steel Corp., Brackenridge, Pa., and was reported in their paper entitled "Effect of Composition on Low Carbon Austenitic Chromium-Nickel Stainless Steels."

Results of this work indicated that low carbon chromium-nickel stainless steels in the fully annealed condition are no more resistant to corrosion than steels of similar composition but of higher carbon content. Neither carbon, nickel nor nitrogen influenced the corrosion rates in boiling nitric acid, or the resistance to sulfuric acid, salt spray or pitting.

Since interest in low carbon stainless steels is based on their expected retention of corrosion resistance after relatively short periods of exposure in the sensitizing range, and immunity to intergranular attack after long periods of exposure, the behavior of the steels—to be satisfactorily substituted for the columbium or titanium grades—must be considered from two

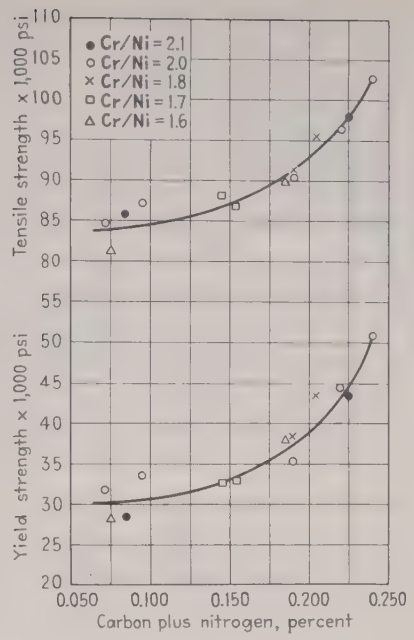


FIG. 2 - Effect of "carbon plus nitrogen" on the yield strength and tensile strength of various chromium-nickel alloys.

angles; (1) where welding and/or stress relieving is involved and the steel is subjected to relatively short periods of time in the carbide precipitation range, and (2) where the metal will operate for most of its service life in the sensitizing range.

As was expected, low carbon 18-8 showed superior resistance to intergranular corrosion than the normal 18-8 steels containing about 0.06 pct C. However, where changes in the corrosion resistance after short periods of exposure (100 hr) in the sensitizing temperature range are considered, the effect of carbon and nitrogen is determined by the chromium content. When the chromium is approximately 17.5 pct, the carbon content must be kept well below 0.03 pct, along with low nitrogen. With increasing chromium, up to 20.5 pct, the influence of carbon and nitrogen becomes less pronounced, and with 19.5 and 20.5 pct Cr, carbon up to 0.37 pct, or nitrogen up to 0.25 pct did not severely impair the corrosion resistance after sensitizing for 100 hr at 1000°F and 1200°F.

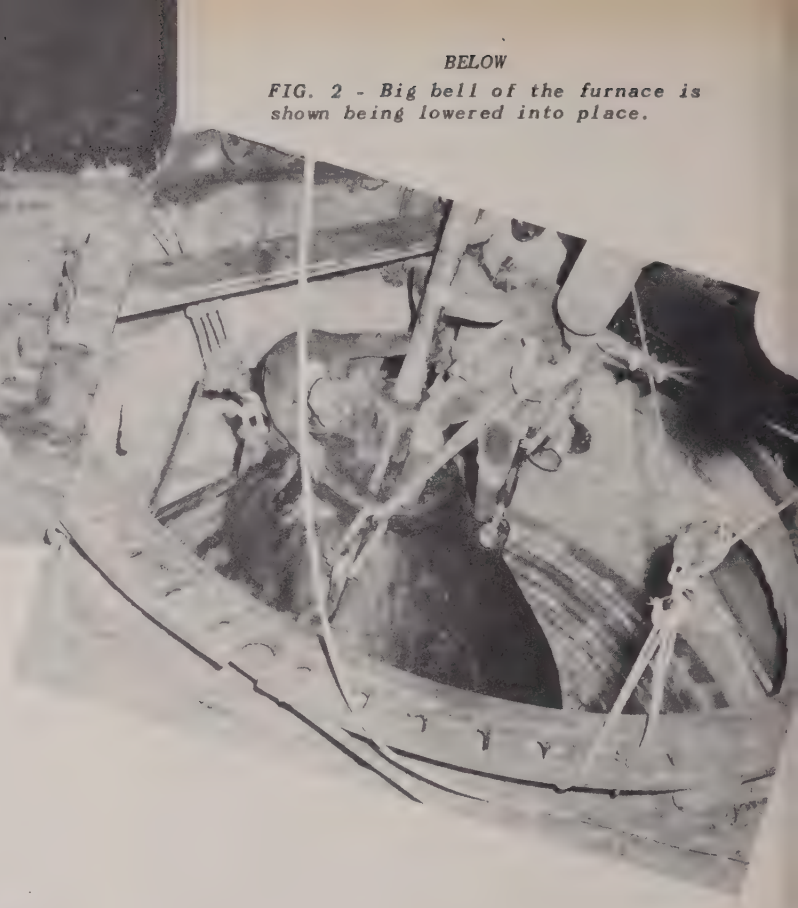
Where substantial immunity to intergranular attack after long periods in the sensitizing range is concerned, the effect of composition parallels that of the short-time tests, with the exception of nickel. While the data are not complete, there is sufficient evidence that a high chromium: nickel ration is beneficial.

The mechanical properties of the low carbon steels is affected by variations in chromium, nickel and or nitrogen to about the same degree as the higher carbon chromium-nickel steels. The tensile properties appear to be a function of the carbon plus nitrogen content, see fig. 2.

Only one chromium-nickel range (19 Cr—8 Ni) was investigated for impact strength. At room temperature neither carbon nor nitrogen materially affected the results. At subzero temperature, —320°F, high carbon and/or nitrogen lowered the impact strength, whether fully annealed or sensitized at 1200°F.

ABOVE

FIG. 1 - Bricklayers are mortaring brick lining inside the carbon block shell of the furnace. Bricks of fused alumina and zirconium were used in place of the usual steel stock line.



BELOW

FIG. 2 - Big bell of the furnace is shown being lowered into place.

Armco Relines Blast Furnace in 33 Days

RELINING of a 900-ton No. 2 blast furnace at Hamilton in the record time of 33 days was accomplished recently by Armco Steel Corp. Opening of the hearth and bosh to allow a No. 4 bulldozer to take material cut to the top of the hearth proved to be a major time saver in the process.

The company began advance preparations months before the shutdown in order to get the unit, the No. 2 blast furnace, back into operation as quickly as possible, and had established a time schedule for every detail of the procedure.

As the first step, the bell rod at the top of the furnace was burned off while the unit was still in operation and the 16-ton bell was dropped into the furnace and melted down. The furnace was then kept fired without the bell until the last cast had been made.

Relining of the Zug Island B furnace of Great Lakes Steel Corp., Detroit, rated at 1250 tons, in 44 days was described in IRON AGE, Sept. 18, 1947, p. 74.

Following this procedure, subsequent dismantling of the top units proved easier and it was estimated that dropping the bell saved as much as three days dismantling time.

Instead of using the usual metal stock line in the furnace, Armco installed ceramic bricks, made from fused alumina and zirconium and having a hardness of nine. This is said to be the first trial of this brick as a steel stock replacement in blast furnaces.

Bricklayers, as shown in fig. 1, worked 20 hours daily and used a total of 400,000 nine-inch equivalent bricks in the job. The number of men working on the project varied considerably as wrok progressed; but in general, as many men as could work without crowding were used in digging out the salamander, setting the 254,610 lb of carbon blocks, and in doing the other reconstruction work. Engineering plans for placing the big bell of the furnace, fig. 2, had been developed well in advance so that considerable time was saved in this part of the operation.

The furnace, originally built in 1939, has an 18 ft hearth diam, 3 21 ft 6 in. bosh, is 94 ft high and has been relined three times. The last previous relining in 1944 required 44 days. The furnace had turned out nearly 1¼ million tons since its last relining and had produced 322,015 net tons, 5.2 pct over its rated capacity and an all time production record for the unit, during the last year.

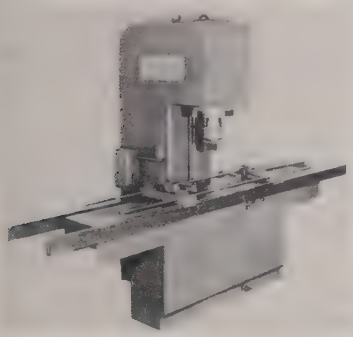
Time lapse between the final cast prior to shutdown and the first cast with the relined furnace was exactly 33 days 20½ hours, or 32 days 10½ hours from blowout to blowin. Assisting Armco on the project were Anderson Construction Co., Buffalo; Champion Bridge Co., Wilmington, Ohio; and A. Benzing & Sons Co., Hamilton, Ohio.

New Production Ideas . . .

A straightening press for heavy duty work, a multi-operation indexing machine, an abrasive cutoff machine, an automatic loader for gear shavers, a micrometer cross feed dial for turning and boring, a sand conditioner, boiler tube cleaners, material handling trucks, and various small tools are new and improved products discussed this week.

Straightening Press

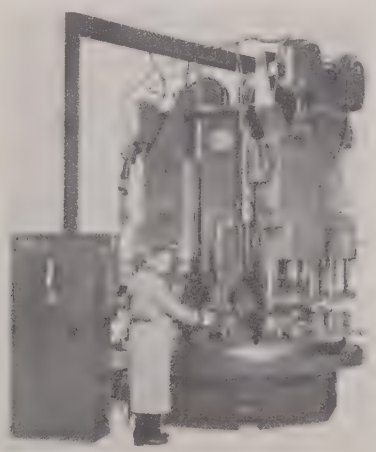
A 75-ton hydraulic straightening press, announced by *Colonial Broach Co.*, P. O. Box 37, Harper Station, Detroit, employs a



double rail straightening fixture to take care of the large and heavy work. The open side frame is of welded construction and motors are built-in. Rams are direct acting from high-capacity hydraulic cylinders mounted in the head. The rams are available with bronze or steel noses. Work supports may be either center or roller type. Standard equipment includes hand controls and pressure gage; foot pedal operation is special equipment. Stroke of the ram is 12 in., with a power stroke speed of 45 ipm and a return speed of 90 ipm. The hydraulic system is operated through a 15 hp, 1800 rpm motor.

8-Station Indexing Machine

A MULTIPLE operation 8-station indexing type machine known as the Model VSI and manufactured by *Davis & Thompson Co.*, Milwaukee 14, reams and chamfers in a 1.281-in. hole and saws slots in both ends of front suspension spindle support arms. The work circle of this machine is 80 in. with and 88 in. diam. table. The work table is mounted on a ball bearing race having an external micro adjustment for table clearance. Indexing of the table is accomplished hydraulically. Drill heads are individually counterbalanced units, hydraulically operated for rapid advance, feed, and rapid return. The column is designed to provide the number of stations required for a



specific job and the electrical system provides complete operator control for both manual or automatic cycling.

Presses

IMPROVEMENTS in all Press-Rite presses and addition of a 12-ton press to its line have been announced by *Sales Service Machine Tool Co.*, 806 Lumber Exchange Bldg., Minneapolis 1. All presses, with the exception of the No. 0 press, are built with anti-friction roller bearings in the flywheels, a positive single-stroke clutch, a clutch dog which engages into a four-point steel ring attached to the flywheel hub, and a cam-actuated automatic brake. The clutch engaging and disengaging pawl is operated by a built-in cam built in the crank drive integral collar of the crank. This cam revolves with the crank and when the clutch is tripped by a foot treadle

or any other engaging mechanism, the disengaging pawl is locked in a positive position until the clutch dog is completely disengaged. The automatic brake need not be adjusted because of light or heavy dies or hot brakes. The only adjustment required is an occasional take-up for usual wear.

Drill Unit

PRODUCTION drilling can be done in any position, angle or plane by a new air-hydraulically operated power unit developed by *Cleveland Republic Tool Corp.*, 1265 Union Commerce Bldg., Cleveland 14. The drill unit can be used as a single unit or combined with several simultaneous operations. Two models, the 250 and 500, drill ¼ and ½ in. in steel, respectively, and both feature a rapid approach and variable feed which allows the tool to come within 0.001 in. of the work, at which point the work feed automatically cuts in smoothly and

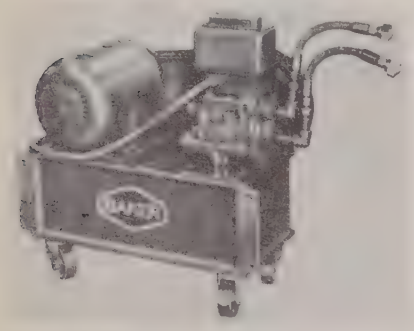
without hesitation. A micrometer adjustment and a lock screw control depth of operation to tolerances less than 0.001 in. Motor and operating mechanism are totally enclosed. Units can be provided with hand, foot, semi-automatic or fully automatic controls, and may also be used for milling, riveting, chamfering, slot sawing and spot facing.

Stock Reels

A LINE of new and improved stock reels numbering more than 25 models is available in spoke or disk type, plain, automatic brake or motorized spindles, from *LaBahn Machine & Mfg. Co.*, Menlo Park, N. J. The reels can be tilted from vertical to horizontal, through an arc of 90° and a self-centering feature and adjustable stock guides are included on most models. The reels are supported on cast-iron bases and adjustable for height. Capacities range from 150 to 1000 lb.

Hydraulic Power Unit

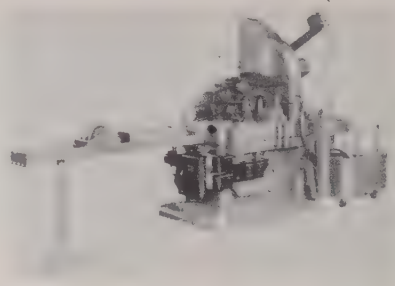
A SEPARATE, mobile hydraulic pump and tank unit has been introduced by *Baker Bros., Inc.*, 1000 Post St., Toledo, Ohio, for use with hydraulic feedway type units.



The power unit, mounted on casters, includes advantages of the permanent type hydraulic system in addition to utilities provided by location outside the machine base. Units are exchangeable and machine operation is smoother through more efficient cooling of the hydraulic fluid. The unit is attached to the operating cylinder of machines by high pressure hose lines joined with self-sealing couplings that permit breaking the line without influx of air into the hydraulic system. The pump unit uses an Oilgear variable delivery feed pump of the positive displacement, variable delivery, radial piston type.

Abrasive Cutting Machine

SOLID stock up to 6 in. diam can be cut by an automatic abrasive cutting machine with an oscillating



head, manufactured by *Andrew C. Campbell Div., American Chain & Cable Co., Inc.*, Bridgeport 2, Conn. The machine is sequence timed, requiring no adjustment of the timing cycle regardless of size of stock or length of feed. Stock feed, clamping, adjustment for wheel wear, ejection of cut pieces, and stop after final cut are completely automatic. A coolant system helps the machine smooth as it cuts.

Welding Torch

METAL 1/32 to 4 in. thick can be cut with a new welding and cutting torch introduced by *Hamilton Tool Co.*, 9th St. at Hanover, Hamilton, Ohio. Its flexible head revolves through an arc of 180°. It is said to execute clean and accurate grooving operations, and to cut the heads from rivets and bolts without blemish to the surface of the work area. Holes and circles from 3.8 to 30 in. diam can be cut with an accuracy to within 1/64 in. Holes can be countersunk and bevels can be cut in a single operation on one or both sides of a straight cut. A side-opening tip lock-nut decreases time required for insertion or removal of tips.

Low-Friction Center Blocks

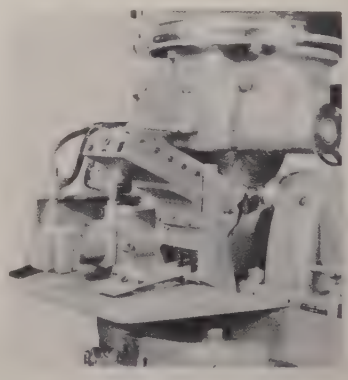
BY a design change in the center block of universal joints manufactured by *Curtis Universal Joint Co.*, Springfield 7, Mass., frictional heat is reduced to a minimum. Two shallow grooves on each of the four bearing surfaces of the center block break each surface into four smaller areas, reducing the size of areas subjected to friction, and causing more even distribution of wear. The grooves conduct oil more effectively to lubricate wearing surfaces, and allow frictional heat to be dissipated more uniformly and rapidly, it is claimed. Grooves do not reduce the breaking load in torque or tension. Joints featuring these center blocks range from 1¼ to 4 in. OD.

Wire Stripper

STRIPPING of electrical wires is speeded by the use of Formula 21, developed by *Aircraft Marine Products, Inc.*, 1593 N. 4th St., Harrisburg, Pa., for removing Formex, Formavar, enamel, and similar wire insulating coatings. Wire is dipped in the liquid and wiped off. The product is claimed to be non-corrosive, non-inflammable, and will not harm metal.

Loader for Gear Shaving

AN automatic loading mechanism developed for use with Red Ring diagonal gear shaving machines takes 2.3 sec for loading and unloading a gear. With this mechanism, announced by *National Broach & Machine Co.*, 5600 St. Jean Ave., Detroit 13, machines run continuously as long as the magazines are supplied with work gears. At the start of the operat-

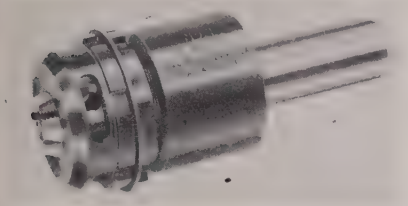


ing cycle, head and tailstocks are in retracted position. The loader moves toward the cutter and meshes the work gear with the cutter, after which the head and tailstocks advance and clamp it in shaving position. The loader moves back to the magazine to pick up another gear and shaving begins. When the shaving is completed head and tailstock retract allowing the shaved gear to drop onto the unloading rails. The magazine supplies work gears to the loader by gravity. Loader, head and tailstock are air-operated. This automatic loading

mechanism is adaptable to the shaving of all automotive transmission gears or other gears of approximate sizes.

Die Holder

IN an improved acorn die holder, produced by *R & L Tools*, 1825 Bristol St., Philadelphia 40, a large keyed ring washer separates the



cap and lock nut and facilitates tightening and adjustment. Spanner wrench notches in the cap and locknut simplify and speed the accurate adjustment of the die. Clutch mechanism is the same as used in the R & L tap and die holder.

Micrometer Cross Feed Dial

ANY of three individual direct readings may be selected for turning or boring, with a direct reading micrometer dial developed by *Springfield Machine Tool Co.*, Springfield, Ohio. The three direct readings are combined in one indicator conveniently located to make the desired setting, quick, easy, and accurate. Direct readings in thousandths are possible through

individual windows selected with a knurled ring at the front of the indicator housing. Only one window with one set of graduations is exposed at any one time. OD, ID, and depth of cut are given on the one dial through its own window. All other graduations are hidden.

Sand Conditioner

A ONE-MAN operated Royal DPL sand loading and conditioner moves directly into a sand heap, scoops up the sand, feeds the built-in combing belt, sand separator and blender, culls out trash, and discharges 40 to 50 tons of conditioned sand per hr. Three motors operate the machine travel, bucket loader, and combing belt and use a total of 11 hp. A magnetic reversing switch controls the variable

speed motor which drives the unit. One magnetic switch controls the gear head motor which powers the bucket elevator and screw, and another controls the motor operating the sand separator and blender. Speed range forward or backward is 6.2 to 50.1 fpm and steering is done by levers through clutches controlling two drive wheels. Weight of this machine which is manufactured by *Royer Foundry & Machine Co.*, Kingston, Pa., is approximately 5100 lb.

Five-Speed Transmission

AN extra-large, five-speed transmission, for use with the largest automobile engines and commercial trucks, has been introduced by *Fuller Mfg. Co.*, Kalamazoo, Mich. The new transmission, Model 5A1120, provides the same gear ratios as the Model 5A920, but has greater capacity. The transmission is built for engines with a piston displacement up to 1120 cu ft. It features all-helical gearing in the forward speeds, three-point bearing suspension for the main shaft, and maximum-capacity bearings in all positions.

Tube Cleaners

BOILER tubes can be cleaned with an improved swing-frame type cutter head, announced by *Lagonda Div., Elliott Co.*, Springfield, Ohio. In the cutter head, the threaded type cutter pin is eliminated; a new style cutter pin is locked in place by a small piece called a keeper which fits into slots in arm and cutter pin. The swing-frame type of cutter head consists of a spider fitted with arms which swing out on arm pins under centrifugal force. The arms carry cutter pins on which are mounted

sharp, heat-treated cutters that do the work. In front are cone cutters for engaging thick accumulations, followed by star cutters for polishing the tube. No tools are necessary for disassembly of the head.

Carbide Mills

MICRO-MILLS for speedy internal finishing are available from *Severance Tool Industries, Inc.*, 742 Iowa St., Saginaw, Mich., in nine standard sizes from ⅜ to 1½ in. diam and having tapered shanks. Standard internal grinding spindles or quills can be adapted for the mounting of the Micro-Mills and instant and positive alignment is realized. Bores can be

sized in one or two passes, in a fraction of the time consumed by internal grinding with finishes having comparable profilometer readings.

Gas Burners

FIVE sizes in a new series SP gas burner provide a range from 150,000 to 2,000,000 Btu for steam and hot water supply boilers, hot air furnaces, and special heat applications, the manufacturer *B. P. Lientz & Co.*, P. O. Box 2275, Kansas City, has announced. The units are designed for conversion

and commercial installations. The use of stainless steel in the mixing plate eliminates warping and cracking common in cast mixing plates. Multiple-orifice burner tips, also of stainless steel, break the gas into a fine spray, aiding combustion, and producing a more efficient radiant flame. The burners come with 5, 9, 14, 20 or 26 tips and may be used with natural gas, manufactured gas, or liquid petroleum gas-air mixtures. They are built and shipped as a packaged unit.

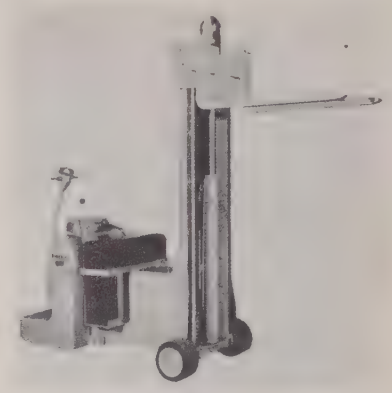
Time Delay Relay

TWO timing sequences for use in processing, machine tool, signal, sound and other control equipment or systems are possible with the Bulletin 362 motor-driven time-delay relay with composite connections, designed by *Ward Leonard Electric Co.*, Mount Vernon, N. Y.

By properly connecting external connection jumpers to the relay terminal board, "delayed make" with a maintained pilot circuit, and "instantaneous make" and "delayed break" with a momentary contact pilot circuit can be obtained. The relay consists of a small synchronous motor, a differential gear system, a built-in brake assembly, a trip switch assembly, an accessible terminal board, and an auxiliary relay. A safety locking device prevents any unintentional change in time setting.

Suspended Fork Truck

AN automatic tilt at carrying position is a feature of the suspended fork model Transtacker, announced by *Automatic Transportation Co.*, 149 W. 87th St., Chicago. The tilt operates through a vertical cam, 9 in. high, bolted to the lower front of the truck's mast. As the fork carriage is raised, the cam pushes the lower carriage roller forward, tilting the entire carriage and raising the front end of the forks. Height of tilt may vary from 3 to 12 in. above the floor, making possible the handling of anything from tinplate pallets to



12-in. skid platforms. Road clearance is 4⅝ in. The truck features a new repositioned hydraulic release lever, new push button controls, and a new hydraulic-lift motor and pump which is a direct connected integral unit. Capacity is 2500 lb for a 36-in. load, or 2000 lb for a 48-in. load. Lifting height of the forks is 64 in., and the overall height is 79 in.

Automatic Pallet Loader

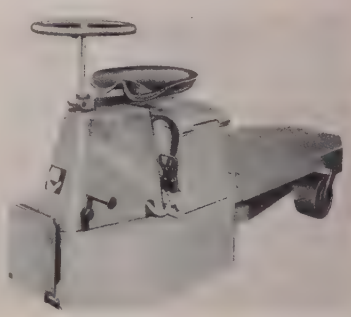
AN automatic pallet loader, announced by *Lamson Corp.*, Syracuse 1, receives cartons or cases from a conventional conveyer and loads them on a pallet, according to a predetermined pattern, to form a stable interlocked load. The loaded pallet is then automatically discharged to a roller conveyer from which it is removed by fork trucks. Different size cartons and stacking patterns can be handled on one machine and the change from one carton or stacking pattern to another is accomplished by a push button.

Sheet and Strip Marker

SHEET and strip marking up to 2000 fpm and a complete die change in 30 sec are possible with a new Master Marker automatic printing machine announced by *Pannier Corp.*, 206 Pannier Bldg., Pittsburgh 12. Materials of any thickness can be marked with the device. Mounted and positioned on an overhead crossbar, the device is motivated by a friction-driven lubricated roller bearing wheel with a rubber tire. The wheel is driven by either the product or conveyer at production speed. It need not ride on the product. A full counterweight is mounted on the wheel axle for perfect balance. The machine uses Pannier brass-back dies, with one or two dies used at any spacing required. The felt ink roll is inked from the face.

Electric Lift Truck

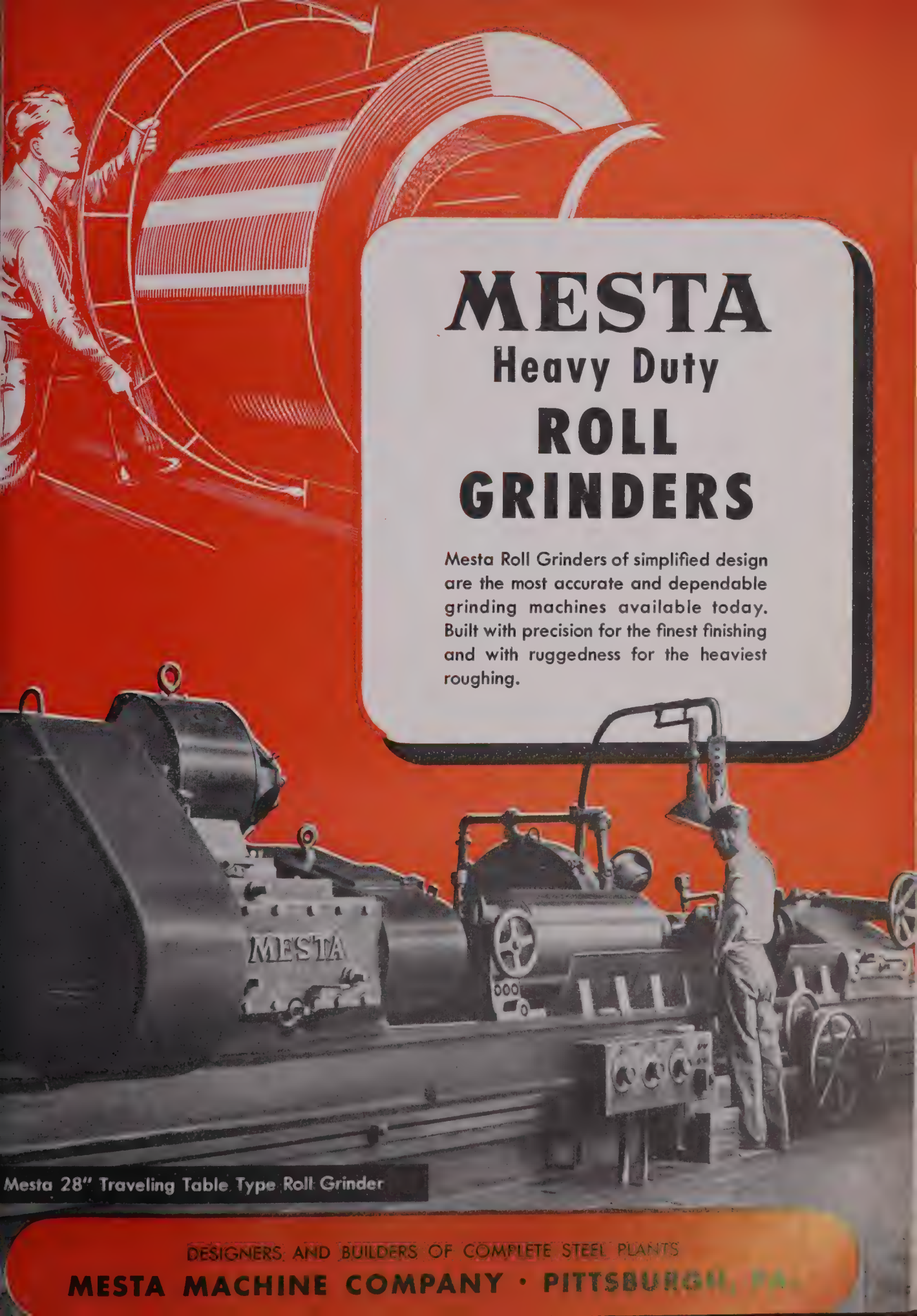
A RIDER-CONTROLLED electric life truck, announced by *Market Forge Co.*, Everett, Mass., features a swivel seat permitting the operator to face toward or away from the load, when negotiating narrow aisles. Where the operator must be on and off the truck quickly, a folding step is provided. The truck, called Load-Mobile, has two speeds, and foot-pedal dead-man control. Two models are available: 3000 and 5000 lb, both with 20 pct guaranteed over-



load capacity. Lengths range from 36 to 72 in.; width 26 in.; and heights, 6, 7, 9 and 11 in. The power unit, including the storage battery, can be detached from the load-carrying section.

Draft Gage

ACCURATE draft measurements for setting draft controls, and lining up burners and control valves into level operating position can be made with the transparent draft gage announced by *F. W. Dwyer Mfg. Co.*, 317 S. Western Ave., Chicago 12. A circular spirit level has been built into the body of the gage. The Visi-Draft fits the hand, permitting its use for leveling valves in small spaces. Both direction and amount of leveling necessary can be found in one check. The level is precision made and ⅝ in. diam; it indicates 1° out of level with each 1/10-in. bubble movement. The scale is graduated in 0.01-in. divisions, easily read from above.



MESTA
Heavy Duty
ROLL GRINDERS

Mesta Roll Grinders of simplified design are the most accurate and dependable grinding machines available today. Built with precision for the finest finishing and with ruggedness for the heaviest roughing.

Mesta 28" Traveling Table Type Roll Grinder

DESIGNERS AND BUILDERS OF COMPLETE STEEL PLANTS

MESTA MACHINE COMPANY · PITTSBURGH, PA.

Assembly Line . . .

WALTER G. PATTON

• New Ford models are introduced at the Waldorf in New York . . . Cars stress simplicity of design, less weight, increased passenger comfort and gasoline economy.

DETROIT — The car which Henry Ford II hopes will "beat Chevrolet" was introduced at the Waldorf in New York this week with great fanfare. No car in recent years has received a greater buildup in the press or over the air. What impressed many members of the Detroit press corps who rode a special train to New York to participate in the ceremonies was the noticeable absence of adverse comment on the new car.

The styling of the new Ford made an immediate hit with the assembled critics. The long, low silhouette of the car follows the well-developed trend of the industry in the direction of lower centers of gravity. The low, simple radiator grille elicited favorable comment from those who have contended that the grille of many modern cars is too complex and extravagant.

No complaints were heard about lack of headroom in the new Ford models. There is ample leg room and the generous luggage compartment also received favorable attention.

It was also noted that the new Ford has almost completely avoided the use of plastics. The diecast hardware is heavier and sturdier. The plastic instrument panel has been replaced. Even the knobs of the instrument controls are chromium-plated.

A comparison of some of the specifications of the 1949 four-door sedan with the predecessor model will serve to indicate the engineering advances incorporated in the new Ford model.

Both the 1948 and 1949 cars have 114 in. wheelbase. However, the new model weighs 239 lb less than the predecessor model and is the first postwar car reporting an appreciable reduction in weight. Curb weight of the 1949 Ford is 3175 lb compared with 3414 lb for the 1948 four-door sedan.

Height of the new Ford loaded is 62.75 in., a reductio nof 3.4 in. Tread front and rear of the 1949 model is 56 in. compared with 58 in. front and 60 in. rear tread for the 1948 model.

The V-8 powerplant has been modernized but is still 239 cu in. rated at 100 hp. The powerplant of the six is entirely new; the new engine is 226 cu in. and is rated at 95 hp compared with 90 hp for the previous model.

As in the case of the Lincoln and Mercury, the new Ford has independent coil springs in front and longitudinal leaf springs in the rear. The earlier models used transverse leaf springs in both front and rear. The Hotchkiss drive is specified, eliminating the torque tube construction previously employed.

The differential of the new Ford is semifloating, hypoid, 2-pinion compared with ¾ floating, spiral bevel, 4-pinion design. The tire size for both cars is 6.00 x 16. However, air ride low pressure tires are available as optional equipment.

BY moving the body 5 in. forward and cradling the seat between the axles Ford has been able to increase the width of the body at the center pillar 5.4 in. Front seat hip room has been increased 6.2 in. and rear seat hip room has been increased 8.5 in.

As has been pointed out previously in IRON AGE, one of the most significant advantages of the new passenger car styling is the increased seat width that is available with this design. It is evident that Ford engineers have taken full advantage of style change to increase seating capacity for the passengers.

The new Ford grille is of distinctive design and is probably the simplest construction offered up to this time to the motoring public.

The hood is shorter than the previous model. Front fender height is only slightly less than that of the hood. Unlike the Lincoln, the lights are flush rather than recessed.

The new Ford cars contain 20 sq ft of window area, a substantial increase over the previous model. In view of the increased glass area, the substantial drop in weight of the new car ranks as an outstanding engineering accomplishment. Most of the weight has been taken out of the frame which is of box-type, all-welded construction. Although lighter, Ford engineers claim the new construction is 59 pct more rigid when combined with the body.

Another substantial weight saving has been accomplished by substituting welded construction for the rear end assembly in place of a malleable iron casting.

The new Ford windshield is increased in height and width and the rear window is now larger than an ordinary windshield.

All doors hinge at the front and the inside handles push up instead of down when opening the door.

Steering of the new cars has been greatly improved, particularly under severe wind conditions.

The new Ford powerplants have a redesigned cooling system, a new intake manifold and the combustion chambers have been redesigned.

Ford stylists have given a great deal of consideration to car interiors. Chrome trim both inside and outside has been reduced. Instruments are grouped in a central panel for easy reference by the driver. Fuel level, oil pressure, water temperature and battery charge indicators are placed outside the rim of the speedometer. The glove compartment on the right hand side has been enlarged.

THE new lines of cars will be available as the Ford and the Ford Custom. Both lines will offer a four-door sedan, two-door sedan and club coupe. A convertible and station wagon will be available in the custom line only.

Although prices for the new

The Airless Wheelabrator
Abrasive Blast Cleaning Process

Replaces 4 Tumbling Mills

Provides a perfect anchor for galvanizing and japanning

Eliminates Pickling prior to Galvanizing

The many savings that accrue from the use of the Wheelabrator method of Airless Blast cleaning have been proved again. Installation of a 27" x 36" Wheelabrator Tumblast (5 cu. ft. capacity) at the Boston & Lockport Block Co. of East Boston, Massachusetts, completely revolutionized their cleaning operation. Loads averaging 400 lbs. of forged steel tackle blocks are now cleaned in ten to fifteen minutes. By previous methods, even smaller loads had to be tumbled for 20 minutes and then pickled for a period of one to eighteen hours, depending upon the type of forging.

With the installation of the Wheelabrator, it was soon discovered that FOUR tumbling mills could be eliminated and pickling discontinued, for all pieces which could be Wheelabrated. In addition, the thoroughness and uniformity of the Wheelabrated surface provided the proper "anchor" to bond the galvanizing and japanning finish required.

Wherever the Wheelabrator is put to work it is slashing cleaning costs to new rock bottom lows. At the same time it scours the work uniformly clean in every fillet, recess, pocket, and cavity . . . right down to the gleaming virgin metal.

Typical WHEELABRATOR users in the Heat Treat and Forge Industry

Wyman-Gordon Co.	Cushman Chuck Co.
Billings & Spencer Co.	Simonds Saw & Steel Co.
S.K.F. Industries Inc.	L. S. Starret Co.
Plomb Tool Co.	Ex-Cell-O Corporation
Park Drop Forge Co.	Caterpiller Tractor Co.

This new booklet "Cleaning Problems Solved For Heat Treating and Forging Plants" contains many helpful suggestions on profitable cleaning. Send now for your copy.

American
WHEELABRATOR & EQUIPMENT CORP.
(Formerly American Foundry Equipment Co.)
510 S. Byrkit St., Mishawaka 3, Indiana

models have not yet been announced, most sources believe that price tags will be up approximately 10 pct. The new wage contract offered the UAW-CIO by General Motors and Ford have undoubtedly been a factor in prompting Ford to boost prices. Previously it had been hoped that the jump in Ford prices would be somewhat less than 10 pct.

Among the new interior fabrics being offered Ford owners is a soft gray tweed mixture with a blue stripe. This is combined with a bolster of blue-gray broadcloth to protect the upper section of both front and rear seats. Ford is also offering a new green striped broadcloth and two new adaptions of mohair in a green and maroon stripe and green and gray stripe combinations.

Ford's new 1949 station wagon features a two-door all-steel body in which plywood veneer panels are bolted directly to the steel body. The front door of the station wagon has been enlarged and rear doors have been eliminated as a safety factor. According to Ford engineers this construction helps to eliminate squeaks and rattles. A special X-type frame is provided to support the substantially higher loads often carried in station wagons.

The Ford station wagon seats eight passengers. Baggage can be loaded without opening the end gate at the rear. Two rear seats may be readily removed so that larger loads can be carried.

The 1949 Ford convertible has a front seat 6½ in. wider than the 1948 model. Width of the rear seat has also been increased to provide ample room for three passengers. Luggage space under the rear deck totals 28 cu ft or nearly twice as much as in previous models.

To develop and produce the new cars Ford spent $37,400,000 in tools, dies, jigs and fixtures. According to Ford engineers gasoline economies up to 10 pct are available in the new six-cylinder engine and the redesigned V-8. With the overdrive which is available as factory installed optional equipment, it is claimed that up to 25 pct improvement in gasoline economy is possible.

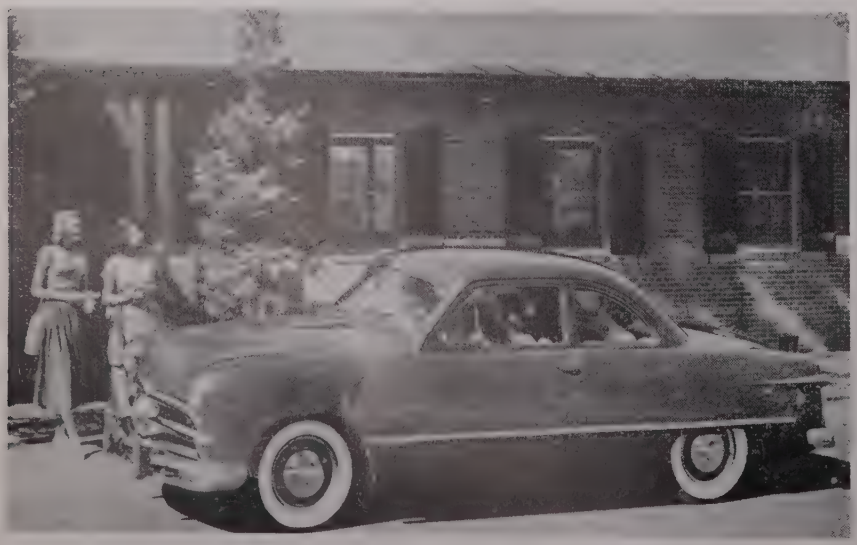
* * *

IN order to save transportation costs which would ordinarily be paid to cover shipment from the factory to the dealer, many Kaiser-Frazer customers are coming to Willow Run to take delivery of their new car. During the past 8 weeks more than 200 cars were delivered from Willow Cottage, Kaiser-Frazer's retail customer driveaway building.

Customers from the West Coast accounted for 40 pct of all deliveries. However during the past 8-week period the driveaway building has been in operation, car customers from 32 states took delivery of their cars in Michigan.

According to Kaiser-Frazer officials, sales of K-F passenger cars are exceeding production at the present time. During the month of May, K-F output was 18,146. At the present time the plant is operating a 9-hr single shift, 5 days per week and 8 hr on Saturday.

HERE IT IS: Advance styling, lots of room for passengers and luggage, improved spring suspension and greater economy are claimed for the new postwar 1949 Ford introduced at the Waldorf in New York this week. The new Ford is the first postwar car with a substantial reduction in weight.



Union Jubilant Over Chrysler Settlement

Detroit

• • • **UAW-CIO leaders** are hailing the Chrysler strike settlement as a victory which has definitely cracked the wage line.

A union leader has charged that the automobile managements were lined up with the steel, electrical and other industries in opposing wage increases.

The 17-day Chrysler strike ended May 29 after the company and UAW-CIO negotiators agreed to a 13¢ hourly wage increase. The settlement tops by 2¢ the General Motors cost-of-living wage agreement signed earlier last week.

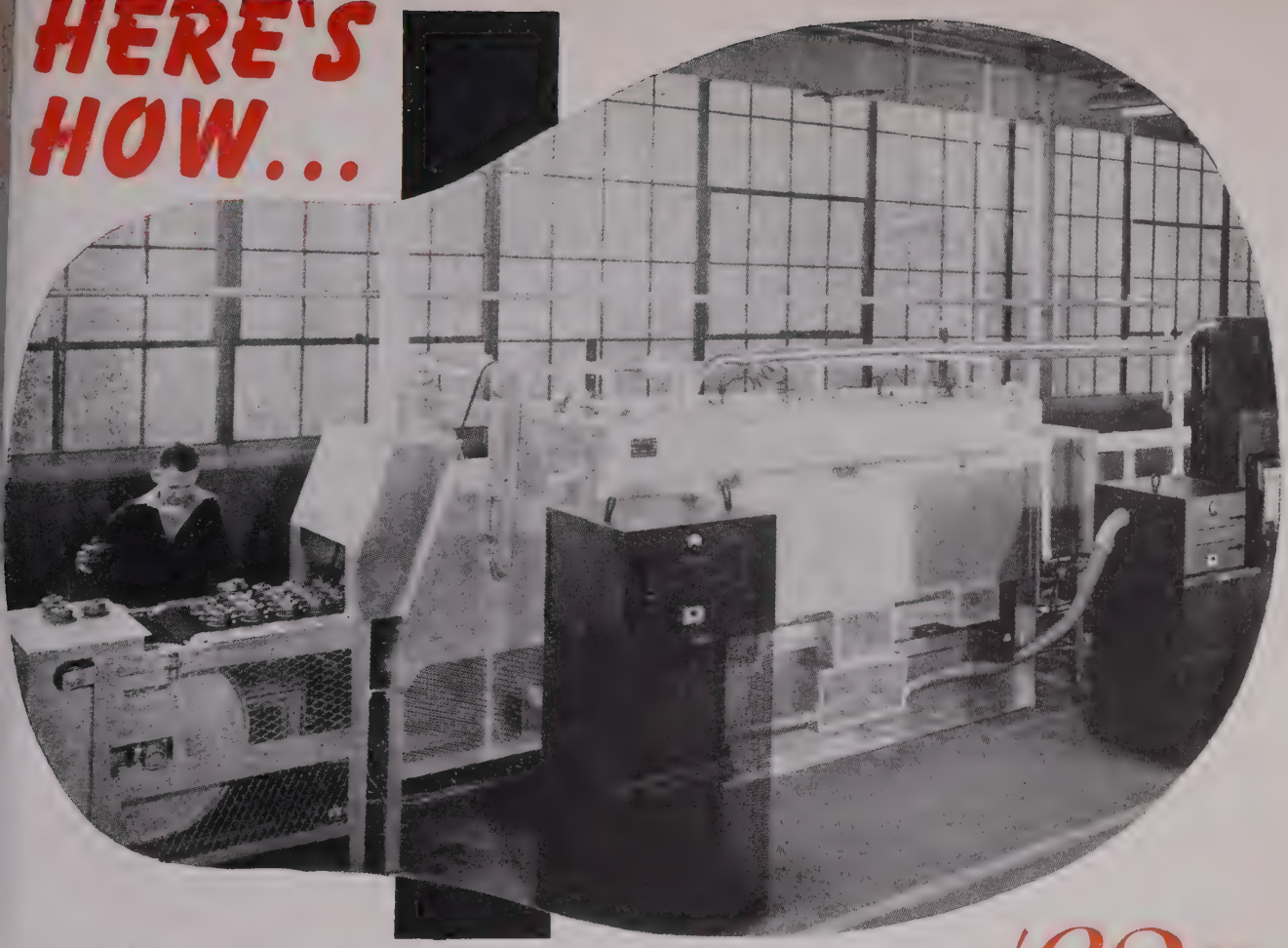
The Chrysler agreement is not related to the cost-of-living and no provision for a basic 3¢ increase next year is provided.

The contract between the company and the union has been extended to August 1, 1950, with each party having the right after June 15, 1949 to reopen the question of wage increases. Wages of all hourly rate employees will be raised 13¢ per hr immediately. In addition, approximately 10,000 salaried employees will receive 9 pct increases.

One hundred employees will receive wage adjustments and will be reclassified. Sixteen hundred employees in the lowest paid jobs will receive an additional 3¢ hourly increase.

Employees with 1 to 5 years seniority will hereafter receive $62.20 vacation pay and those with 5 or more seniority will receive $124.40.

HERE'S HOW...



. . . LINDBERG BRAZING FURNACE CUTS PRODUCTION COST $38.50 per hr.

FIVE PARTS BRAZED IN SINGLE OPERATION

T. E. NELSON, Vice President, Nelson Manufacturing Corporation says: "We're constantly redesigning cast and drop forged parts for production by brazing. In every case so far we have been able to knock costs down plenty."

Nelson Manufacturing Corporation, Pontiac, Michigan, manufacturers of pulleys, sheaves, and other stamped metal products, braze 385 power lawnmower pulleys per hour in Lindberg Mesh Belt Conveyor Furnace. (435 lbs. net; 750 lbs. gross.) Production costs are 10c less per pulley!—a saving of $38.50 per hour over cost of producing pulleys as castings.

Check this "Before and After" story of Brazing advantages.

BEFORE	AFTER
Belt grooves and center hole had to be finish machined with cast pulley—a costly operation.	No machining required for brazed pulley.
Cast pulley weighed 2 lbs. 2 ozs.	Brazed pulley weighs only 18 ozs. —reduces overall weight of mower 1 lb.
Rejects due to casting flaws ran at 6%.	Brazed pulley rejects—None.

Greater Production

Lindberg Brazing furnaces are designed to produce 1½ times greater production per sq. ft. of heating chamber area than conventional brazing furnaces.

Versatile

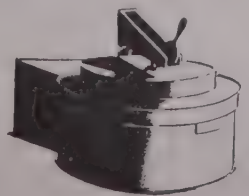
Lindberg Brazing furnaces can also be used for low temperature silver brazing—bright annealing—sintering of powder metals.

No Production Delays

Lindberg Furnaces are designed so that heating elements can be changed in a matter of minutes without cooling furnace.

Bulletin 210 "Lindberg Continuous Production Brazing Furnaces" is available on request. Lindberg Engineering Co., 2452 W. Hubbard St., Chicago 12, Illinois.

LINDBERG FURNACES



Washington . . .

EUGENE J. HARDY

• Industry can begin own mobilization plans, Munitions Board says . . . War would demand 1944 production or better . . . Compiles instructions on what products, how much and where needed.

WASHINGTON—As a further step toward its planning for all-out industrial mobilization in the event of an emergency, the Munitions Board has suggested that industry should not wait for completion of the military program but should start immediately to prepare its own mobilization plans. Much can be accomplished in this way pending completion of the long range program, it says.

Industry has been ready and willing to prepare against future emergencies. It has and still is providing its best minds to make up industrial advisory committees to work out national plans. But as for itself, to date industry has generally been face to face with the same kind of problem it encountered during the defense period and early days of the recent war. This centers around the questions of what should be made, for whom, in what quantities, and what agency authorizes production and negotiates contracts?

Something of the magnitude of the problem is seen in the Board's own estimate that when the nation got into full production at the peak of the war, more than 82,000 manufacturing plants were turning out war materials of one kind or another.

A great deal of confusion had to be eliminated before assembly line output became a reality. Planning for industrial mobilization in the past has always been difficult because the operation itself was poorly defined, the Board realizes. If mobilization is to be fast, a manufacturer must be sure what product he is best equipped to make, who wants it, and what his costs are likely to be.

THE Board has already started its own plant survey and allocation program (THE IRON AGE, Apr. 15, p. 122). Briefly, about 20,000 or about 25 pct of the nation's manufacturing plants are to be surveyed as to type of products, conversion possibilities, and potential war production. Responsibility for planning would then be lodged with the military service which would be the dominant buyer in that particular field. Some of the previous confusion would thus be ended by enabling the plant to deal with a single buyer.

In the meantime, as already stated, the Board now requests each plant to begin its own planning. To help toward this end, the Board has compiled a 48-page booklet of instructions as to how such a program can be started. Entitled "Guide for Joint Industry-Military Procurement Planning," it can be obtained from the Board or from regional procurement offices of the military services.

There are three important general recommendations. First, each plant should set up a planning officer or group to work with the defense establishment. Next, until more detailed information can be made available by the Board, each plant should plan for emergency production at the same rate as in January 1944 or at its highest wartime rate. Finally, pending other arrangements in cooperation with the Board or the military services, plants should plan to produce, if necessary, approximately the same type items it turned out during World War II.

The guide goes much further and into greater detail. Divided into six sections, the first part of the guide outlines the Board's current activity and progress toward mobilization planning.

THE second section gives detailed instructions on individual planning for material supplies, personnel, shipping, plant security, expansion programming, etc., under emergency conditions.

Another section provides a list of materials and products which are necessary to waging war. This includes a summary of items in critically short supply during the recent conflict. Such a list is essential in planning wartime operations.

For example, plants producing items listed as being in short supply should plan for expansion of their facilities in an emergency; those using such items in the manufacture of the lesser essential products might reasonably expect their supplies to be cut down or shut off entirely and should plan to convert to essential production if need arose.

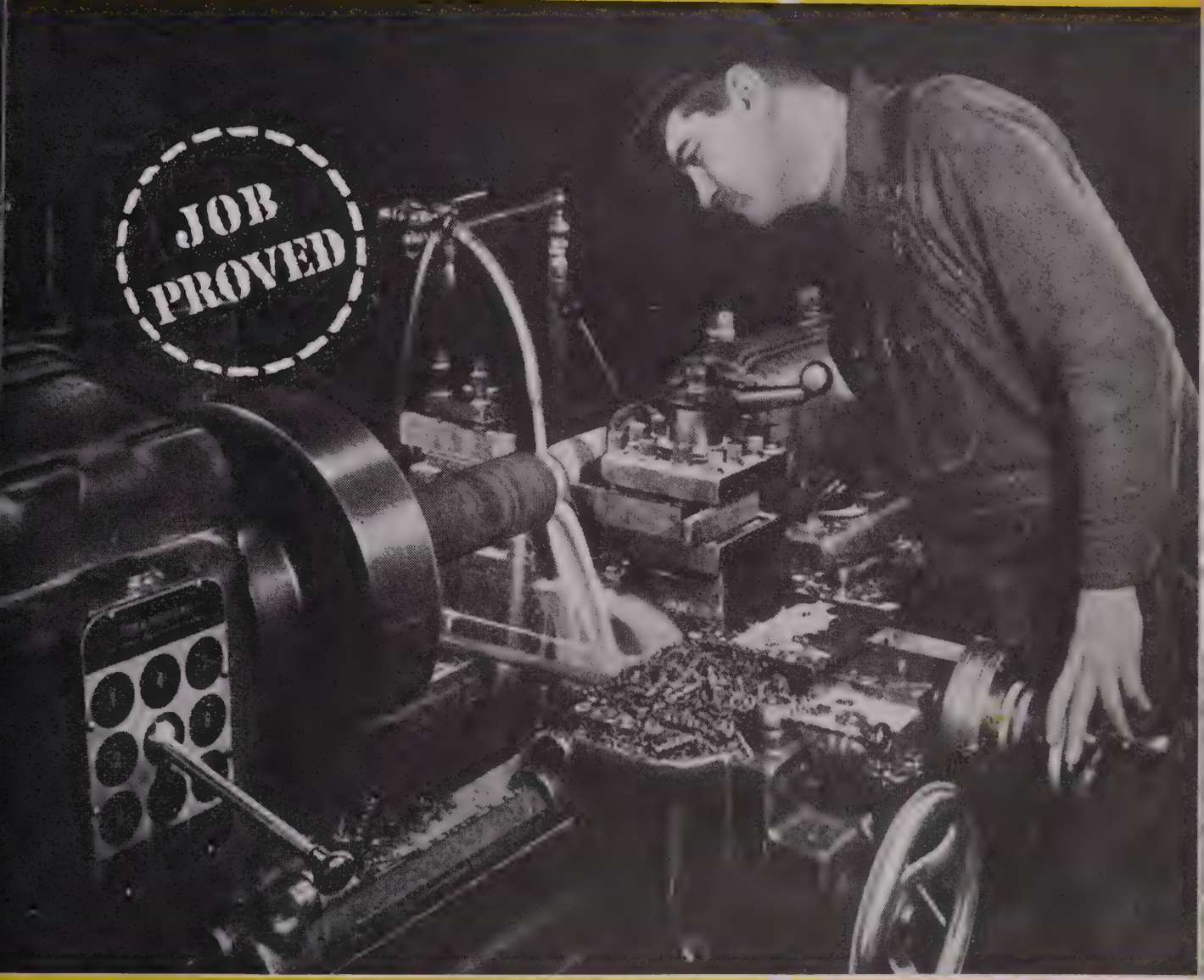
For instance, the Board cites an example of a Tennessee factory which has made such plans to considerable extent. Assisted by the Board, it has made conversion plans, even to the extent of lining up a general manager who would take over in wartime. Also, 200 supervisors have been selected for training to direct others in manufacture of the wartime product which that plant would produce.

STILL another section of the guide contains a list of military Procurement Planning Offices. The purpose of these offices is to plan procedures and maintain contacts with industry. Through this list, the plant planning officer could decide which particular office could be of most help and would need its particular products in time of emergency.

To assist plants which would like to sell to the Army, Navy or Air Force under present procurement programs, the guide also lists the procurement offices now engaged in buying operations together with a list of current items bought by each.

In many cases, each plant is enabled to work with a single mili-

3/8" Cut on S.A.E. 4640 Steel



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Here is a tough job, just one of thousands in which Sunoco makes possible fast, accurate machining:

Machine — 20" x 96" "American" Pacemaker multi-production lathe
Operation — Turning 5" diameter shaft
Material — S.A.E. 4640 steel, heat-treated
Spindle Speed — 133 r.p.m.
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Cutting Lubricant — One part Sunoco to 20 parts water

For greater production, greater accuracy, smoother finish, put Sunoco, the "Job Proved" oil, to work in your shop. Sunoco quickly forms a stable emulsion when mixed with water. It has high lubricating and cooling qualities and is recommended for ferrous and nonferrous metals, alloy and carbon steels. For full information, or for a free copy of "Cutting and Grinding Facts," call the nearest Sun office today, or write Department 1A-6.

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tary procurement officer who buys for all services under present uniform procurement regulations.

"It is to be emphasized, however, that procurement planning as set forth in the 'guide' has nothing to do with current procurement operations," Thomas J. Hargrave, board chairman, says. "We merely provide a plan. Actual procurements depend upon appropriations by Congress according to current needs."

"I should like to emphasize also that under this plan we are not mobilizing or attempting to mobilize industry," he says further. "We are merely attempting to set up, through voluntary cooperation, a plan by which industry can be mobilized with greatest possible speed should need ever arise."

New Hope Arises For Legislation To Keep Basing Point System

Washington

• • • **While Federal** Trade Commission officials last week minimized the effect of the Supreme Court decision in the Cement Case and denied that basing point systems and freight absorption have been outlawed *per se*, Sen. Homer Capehart, R., Ind., presiding over hearings on a resolution to grant additional funds to the Senate Commerce Committee for a thorough economic study of this problem, has indicated that this study might result in a finding that "we need some new legislation on the subject."

The Indiana Senator later told THE IRON AGE that while he has no concrete ideas on what form such legislation might take it was not his intention to attempt to legalize the practices condemned by the Supreme Court in the cement case.

Led by chairman Robert E. Freer, FTC officials contended that systematic absorption of freight to meet competition is illegal *per se*, but "in any individual transaction," the court ruling is not interpreted as prohibiting the absorption or equalization of freight. Nor is the basing point system illegal *per se* according to Mr. Freer.

Walter Wooden, FTC chief counsel and long-term crusader for f.o.b. mill selling supported the views of the Commissioners by pointing out that it is legal for individual sellers to absorb freight so long as (1) such absorption is not part of a price-fixing conspiracy, or (2) such absorption does not result in discrimination which destroys or injures competition among the individual seller's own customers.

However, the qualifications with which the Commissioners hedged these statements indicated that for all practical purposes basing point systems are out. For example, in response to a question from Sen. Hawkes, R., N. J., regarding the rigid steel conduit case, in which the circuit court in Chicago outlawed the basing point system even though a conspiracy did not exist, chairman Freer stated that "the purpose and effect of this pricing system was to arrive at identity of prices," and, consequently, regardless of conspiracy, was illegal.

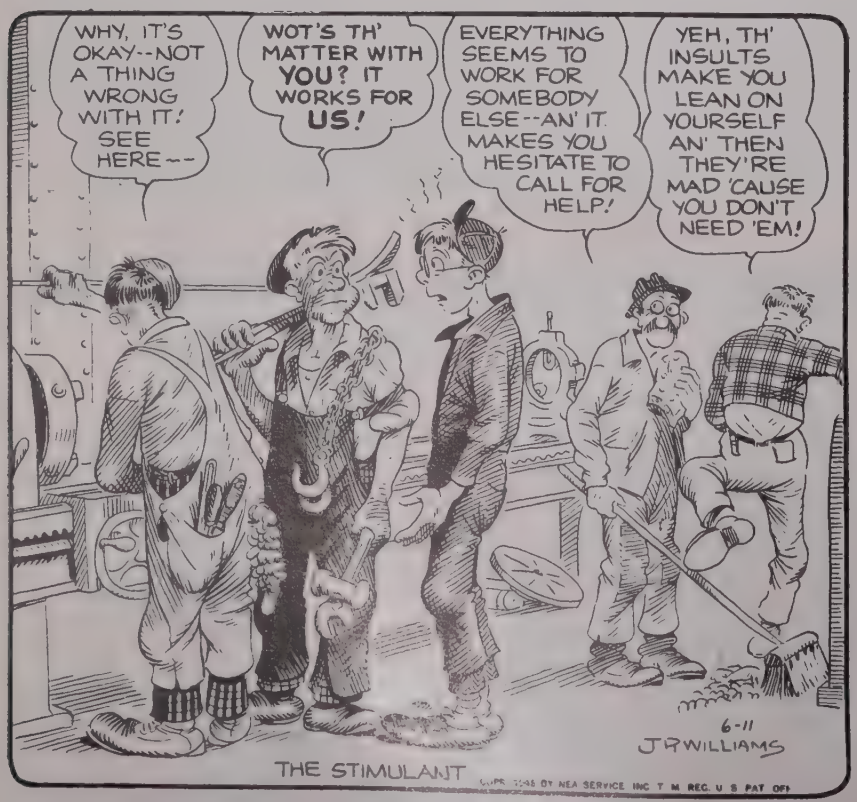
Since any individual absorption of freight would be for the purpose of meeting competitor's prices, which means identical prices, the indication is that this is illegal, despite FTC statements that individual freight absorption is still okay.

Responding to further questioning, chairman Freer flatly stated that he did not think FTC was designed to tell business what it can or cannot do, and that each complaint would have to be decided on its own merits. He added that it was doubtful whether this situation could be corrected by legislation.

Later, Mr. Freer told THE IRON AGE that if the subcommittee hearing did not result in something being done to clarify the effects of recent decisions for business generally, FTC undoubtedly will have to set up some sort of interpretative committee to explain the court rulings.

Much of the questioning concerned the effects of the recent decisions on marketing practices and the subcommittee agreed generally that no antitrust law is so sacred that economic trends cannot warrant changing it. However, there is no reason to believe that any responsible group in Congress will get behind legislation to legalize delivered pricing systems.

THE BULL OF THE WOODS — BY J. R. WILLIAMS


WHY, IT'S OKAY--NOT A THING WRONG WITH IT! SEE HERE--
WOT'S TH' MATTER WITH YOU? IT WORKS FOR US!
EVERYTHING SEEMS TO WORK FOR SOMEBODY ELSE--AN' IT MAKES YOU HESITATE TO CALL FOR HELP!
YEH, TH' INSULTS MAKE YOU LEAN ON YOURSELF AN' THEN THEY'RE MAD 'CAUSE YOU DON'T NEED 'EM!
6-11
J.R.WILLIAMS
THE STIMULANT
COPR. 1948 BY NEA SERVICE INC. T. M. REG. U. S. PAT. OFF.

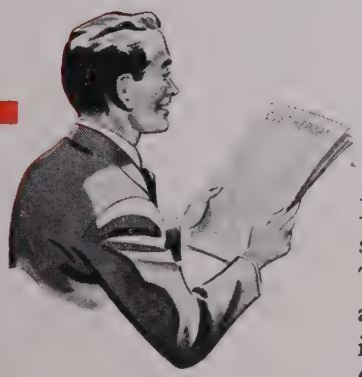
It costs $.027 to use these...

This figure represents the average price of 6 threaded nuts and 6 lock washers, plus the assembly cost required to install them.

It costs $.017 to use these...

Flat Type C7000 SPEED NUTS* cost less than threaded nuts plus lock washers. And the assembly cost is much lower because SPEED NUTS eliminate two operations—applying lock washers and handling wrench.

NOTE: Figures based on findings of an independent cost analysis organization.



In these days of ever-increasing production costs, saving even a fraction-of-a-cent per fastener is important. This fact has led thousands of manufacturers in the automotive, aircraft, appliance, electrical, and other industries to switch to the SPEED NUT brand of fasteners. Typical cost reports reveal assembly savings of 25% to 35% . . . and even more.

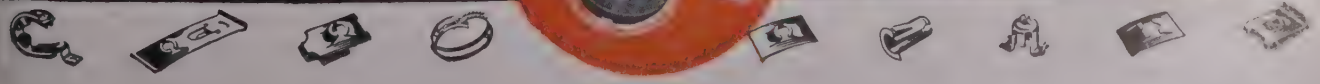
It will pay you to have Tinnerman engineers conduct fastening analyses of your products. Ask your local SPEED NUT representative about this service. Or write us for information and your copy of the new SPEED NUT bulletin. TINNERMAN PRODUCTS, INC., 2038 Fulton Road, Cleveland 13, Ohio.

In Canada: Dominion Fasteners Limited, Hamilton • *In England:* Simmonds Aerocessories, Ltd., Treforest • *In France:* Aerocessoires Simmonds, S.A., Paris

TINNERMAN *Speed Nuts* *Trade Mark Reg. U. S. Pat. Off.

FASTEST THING IN FASTENINGS

MORE THAN 4000 SHAPES AND SIZES



West Coast . . .

ROBERT T. REYNHARDT

• Fabricated steel being barged to Hawaii and steel scrap to be returned same way . . . "Liquidated" aluminum foil plant arrives from Germany . . . Boeing strike is costly.

SAN FRANCISCO — Although the scrap situation has been easing somewhat on the West Coast during the past several weeks, there is considerable interest in the project recently undertaken by the Independent Iron Works of Oakland, Calif., whereby it is barging fabricated structural steel to Hawaii and proposes to return approximately 10,000 tons of scrap from the territory.

First barge of 1600 tons of fabricated steel left port at Oakland recently and was expected to return within a few weeks with 3000 long tons of No. 1 heavy melting scrap produced in the process of wrecking a railroad and pier shed at Hilo. Independent Development Co. has the contract for rebuilding 600 ft of pier shed which was damaged during the war and in return is salvaging rails and structural materials. Work is being carried out under contract with the Territory of Hawaii Commission.

Independent Iron Works purchased a 223-ft-long barge and tug for this operation and equipped it with cranes to handle both the fabricated steel and scrap. Four similar barges are said to be tied up in the Columbia River and it is possible the company may enlarge this operation and utilize additional barges.

No price has been announced for delivery of this scrap to Kaiser Co., Inc., at Los Angeles, but it is understood that it is close to the present going market price of No. 1 heavy delivered to that port.

Independent Iron Works expects to materially reduce hauling costs below the $13.44 gross ton, exclusive of port charges, now in effect by the Matson Steamship Co. According to best recent estimates there are between 150,000 and 200,000 tons of purchasable scrap in the Islands at this time, but recently buyers have been slow to pick it up because of the price demanded by holders who also are attempting to negotiate trade deals whereby they receive finished steel in return for making the scrap available. It is known that at least one large West Coast mill refused to negotiate for scrap on this basis.

It is reported that one large block of unprepared scrap was offered to mainland buyers at $39.00 per gross ton delivered to Atlantic seaboard. Adding $6 to $8 preparation cost this would make the scrap cost approximately $45 to $47 delivered to Atlantic ports which is a figure substantially above the current prices there.

THE metalworking trades recently broke into the shipping news with the arrival in San Francisco of the Motorship Delftdyk of the Holland-American Line from Rotterdam with a cargo of 1350 tons of machinery constituting a major portion of the aluminum foil mill recently purchased by the Permanente Metals Corp. from the Foreign Liquidation Commission.

This shipment was the first of three necessary to transport the complete mill from its original location at Teningen, Baden.

The dismantled plant is moving by rail to the former magnseium plant of Permanente near San Jose, Calif., and will be erected under the direction of Roger Laufer who will direct the operations of the foil mill. The plant is expected to start production late this fall and will have an estimated monthly capacity of approximately 500,000 lb of foil. This estimate is made from the production of .00035 thickness.

Since American Forge Co. is moving its operations to Niles, Calif., to be close to its source of billets from the affiliated Pacific States Steel Co., the Bureau of Yards and Docks of the U. S. Navy is offering the portion of the forge plant formerly operated by this company under lease, at Berkeley Calif., for lease or sale.

The portion of the forge plant built by the Navy during the war occupies approximately 3 acres on which are located an office building 72 x 40 ft; a main forge shop, 224 x 334 ft with a 60 ft height clearance and four inside steel craneways; a 3000 ton forging press; 18 furnaces and miscellaneous operating equipment.

Proposals to buy or lease this unit will be accepted by the real estate and legal division, public works department, 12th Naval District at San Francisco until July 30.

SEATTLE—As the strike at the Boston Aircraft Co. goes into its sixth week, civic leaders are beginning to worry about the amount of business they are losing as a result of this shutdown which is having a widespread effect throughout this area.

There has been a loss in payroll amounting to $163,000 a day or more than $4 million for the first 5 weeks of the work stoppage.

Boeing officials are not sitting idle and the company has been placing subcontracting orders in many West Coast towns and even in the Midwest. While no official estimate is given by company officials as to the amount of the subcontracting being done, it is reliably reported that these contracts are running into several million dollars.

Meanwhile, the strike is no nearer settlement than the day it was called according to best informed sources. There has not been a single meeting of company and union officials during the past 5 weeks and none are scheduled. Company officers state that they will not meet with the union until the "illegal strike is called off," and indicate that they are standing on their contention that the union has lost its right as a collective bargaining agency because it called an illegal strike in violation of the Taft-Hartley Law.

A back to work movement that

CALCULATED Performance

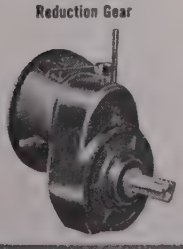
Flawless form, perfect timing, and controlled power take the track star over the high hurdle with ease. His performance is calculated for every foot of the 120-yard course.

As he glides over the barriers, the hurdler allows an exact number of inches above the bar. There can be no margin for error in his calculation.

Years of building physical stamina and long hours of practice make for perfection on the cinders . . . contribute the experience that is the source of control, timing, and winning form.

Thirty years of experience enable the engineers of the Twin Disc Clutch Company to take hurdles in the field of power transmission in their stride. Exact calculations are the basis for the sound design and precision manufacture of Twin Disc Friction Clutches and Hydraulic Drives. These calculations, based on experience, have made possible the efficient performance of all Twin Disc units.

You can hurdle your barriers in the field of power transmission with the help of Twin Disc engineers. Write for their recommendations on your power problems. TWIN DISC CLUTCH COMPANY, Racine, Wisconsin (Hydraulic Division, Rockford, Illinois).



SPECIALISTS IN INDUSTRIAL CLUTCHES SINCE 1918

the company has actively sponsored with advertising has brought approximately 1000 employees back on the job since the strike was called. Another 4000 nonunion employees and supervisors have continued working throughout the shutdown.

LOS ANGELES — The development of subsidiary or sustaining small industries as satelites of a major industry is well illustrated by three developments in this area recently announced. All of these will be largely dependent upon the automotive and aircraft industries and the home appliance field, all of which have become well established in southern California.

Superweld Corp. has been formed to do electric copper brazing of steel, localized heat silver brazing, bright annealing, and will manufacture a line of specialized metal products of its own design. The company is capitalized at $500,000. Walter T. Wells, who is chairman of the board, Lane-Wells Co., has been elected president and general manager of the new corporation.

Superweld Corp. has purchased all furnaces and brazing equipment of Warner Welded Products, Glendale, and has leased the 17,000 sq ft Warner building. The equipment consists of the most modern electric furnaces west of Detroit for custom brazing and bright annealing, according to company officials.

Other officers elected were Robert E. Jones, vice-president, and C. B. Lansdown, formerly assistant treasurer of Warner Manufacturing Co., secretary-treasurer. In addition to the above directors, Harold C. Hill, General Electric Co., Los Angeles, and William M. West, West & Co., specialists in builders' hardware, have also been appointed.

United States Spring & Bumper Co. has leased an additional 40,000 sq ft of floor space to cold form bumper bars, bumper guards and prepolish all bumper stock in the flat. In addition to the existing presses and equipment at this new building, the company is installing approximately $250,000 in new plant facilities.

At its main plant, U. S. Spring & Bumper has installed new equipment to manufacture coil springs for the front end of 1949 model automobiles. The company will spend about $1 million in plant expansion and equipment during the current year. At present they are producing springs and/or bumpers for almost all major automobile and truck companies who assemble on the West Coast.

Western Mouldings & Stampings Inc. has purchased the former plant of the Benton Ballou Co. at Ontario and with an additional investment of $150,000 is establishing a plant to manufacture metal mouldings and stampings for West Coast automobile assembly and for the home appliance field.

The plant is expected to get into operation early in September, according to Howard A. Burelson of Indianapolis, president of the company, and he reports that approximately 100 men will be employed at peak production.

SALT LAKE CITY—Sale of the Remington small arms ammunition plant to three Salt Lake City investors virtually cleans up the war surplus industrial facilities in this area. A few non-industrial properties, such as Bushnell hospital and Camp Kearns, are still to be sold.

The ammunition plant, which cost the government about $20 million, went to John M. Wallace, Harold H. Bennett and Leland Swaner on a bid of $1,620,000. Mr. Wallace is president of the Walker Bank & Trust Co., Mr. Bennett is vice-president and general manager of Z.C.M.I. department store and Mr. Swaner is an investor. The group purchased the property as an investment and already have tenants for a large share of it, although the details of its contemplated utilization have not been disclosed. Z.C.M.I. will use one of the largest buildings for warehouse purposes.

The plant was sold subject to recapture by the Munitions Board on 120-day notice under the National Security Clause.

John L. Lewis and his lieutenants are discovering in Utah that the wives of coal miners are not so responsive to their directives as are the miners.

The union leaders are embroiled with the wives over the issue of heating equipment in the homes at Dragerton, Geneva Steel Co.'s coal mining town. After the company purchased the town, the homes were fixed up, redecorated and equipped with appliances dear to the hearts of the housekeepers. The equipment included oil furnaces.

When word of this reached top union quarters, Mr. Lewis hit the ceiling and forthwith decreed, through subordinates, that no oil heating equipment would be tolerated in a coal mining town. A work stoppage resulted and a compromise was finally reached whereby the company agreed to replace the oil furnaces upon application of individual householders.

A few of the replacements were made. But many of the housewives flatly refused to request a change or to permit the installation of coal furnaces. So most of the 600-odd homes still have oil heating.

More recently the company built an additional 120 homes. They are substantial, newly painted, tastefully decorated houses, fully equipped and ready for occupancy except as to heating. The company is demanding that the union make up its mind as to heating before renting any of the homes at the bargain rates of $22 to $30 per month. Wives of prospective renters want oil. Union leaders must "back water" or insist upon coal. So the attractive homes are standing vacant in the midst of a housing shortage, waiting for the unions to back down or for the housewives to surrender.

Auto Business Remains Among Most Attractive

Detroit

• • • **The automobile business** is still one of the most attractive plums in industry.

Since World War II more new automobile companies have been started than at any time since 1921, according to the Automobile Mfgrs. Assn.

A total of 23 new firms have entered the passenger car field, according to Automobile Facts. Three of the industry's new competitors plan "flying cars"—vehicles that are reported to be equally at home in the air or on the highway. A company formed by three Chinese-American engineers plans motorized rickshaws to sell in China.

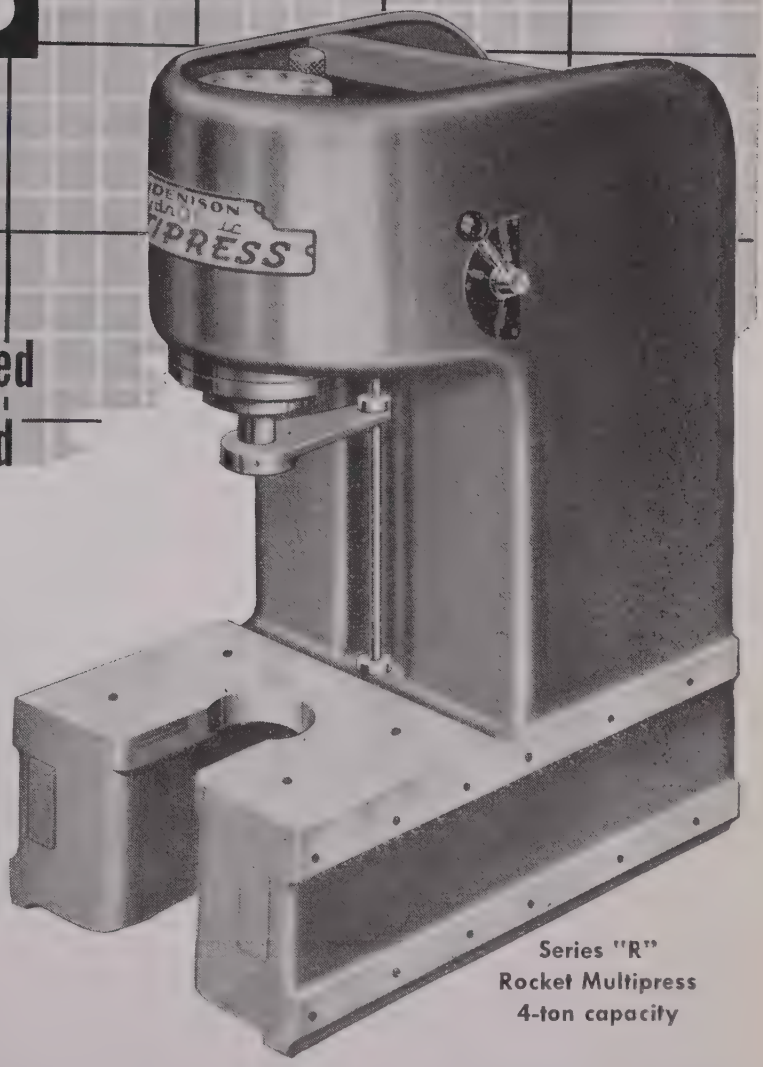
Most of the new companies plan to break into the small car field with automobiles that are announced to sell below $1000. Seven firms in this group plan three-wheel cars.

Two designers of racing cars plan to make full-size automobiles. One has a rear engine design; the other plans custom built cars selling at about $25,000.

THE ROCKET MULTIPRESS*

IS 3 TIMES FASTER

1100 ipm Approach Speed
450 ipm Pressing Speed
750 ipm Return Speed



Series "R"
Rocket Multipress
4-ton capacity

NOW YOU CAN have all the oil smooth efficiency of the Denison HydrOILic Multipress with the plus feature of speeds comparable to the fastest. Yes, 1948 models of the Multipress are faster than ever . . . yet retain all the advantages of the 4-ton series.

Three design changes . . . one in the control system, one in the operating component and one in the power system have combined to provide increased production without sacrifice of either tonnage or operating characteristics of standard models.

If you need greater production at lower cost, require smaller more compact press equipment, want to reduce the wear of expensive dies and tooling, or make use of unskilled labor without sacrificing quality of your product—write today for complete information on the Denison Rocket Multipress. Ask for specific data on the use of the Multipress in the operation in which you are most interested. No obligation of course.

AUTOMATIC CYCLING—COMPARISON CHART

Stroke in Inches	6	5	4	3	2	1	¾	½	¼
Standard Automatic Multipress	20	25	30	40	58	104	130	174	275
Rocket Multipress	75	85	100	120	160	275	300	390	450

Rates shown are for complete cycles per minute.

HydrOILics INDUSTRY'S RIGHT HAND

*REG. U. S. PAT. OFF.

THE DENISON ENGINEERING CO.
1158 Dublin Road Columbus 16, Ohio

DENISON EQUIPMENT in APPLIED HydrOILics

PERSONALS

o o o

• **William L. Dean** has been elected president and general manager of the Mathews Conveyer Co., Ellwood City, Pa. He has been associated with the Mathews organization since 1909, and has served the company as vice-president and general manager since 1943. **F. E. Moore,** the retiring president, has been elected chairman of the board of directors of the company and its subsidiaries. In this capacity, he will remain active in the company.

• **James F. Donahue** has been named executive vice-president of the Lamson & Sessions Co., Cleveland. Mr. Donahue has been vice-president and a director since 1929 when the Foster Bolt & Nut Co., of which he was president, merged with Lamson. **George S. Case, Jr.,** has become vice-president and treasurer after 18 years with the company. He was made assistant to the president in 1940 and has been treasurer of the company since 1942. **Robert G. Patterson** adds the office of vice-president to his former title of general sales manager. Mr. Patterson came with the Lamson & Sessions Co. in 1935. **James M. Rowe,** who has been with Lamson since 1924 in the Birmingham district, has also been elected a vice-president, retaining his former title of general manager, Birmingham plant, a post he has held since 1940.

• **Raymond E. Valentine** has been appointed district sales manager at the St. Louis office of National Malleable & Steel Castings Co., Cleveland, succeeding **John H. Jaschka,** who has retired from active service after 47 years with the company. Mr. Valentine joined National Malleable in 1913. During the recent war he was with the WPB, returning to the company in 1945 as assistant district sales manager at the St. Louis office. **Howard Stark,** field engineer at the Chicago office, has been named assistant district sales manager at St. Louis.

• **James N. Trimble** has been appointed Chicago branch manager for Berger Mfg. Div., Republic Steel Corp., Cleveland. Mr. Trimble joined the Pittsburgh office of Berger in 1934 as a salesman and 2 years later was appointed sales representative with headquarters in Roanoke, Va. **Ralph C. Braden, Jr.,** has been made Kansas City district sales manager for the division. Mr. Braden started with Berger in the sales department in 1946.

J. DOUGLAS DARBY, vice-president in charge of sales, Carnegie-Illinois Steel Corp.

• **J. Douglas Darby** has been elected vice-president in charge of sales of Carnegie-Illinois Steel Corp., Pittsburgh, succeeding **Thomas J. Hilliard,** who has resigned. Mr. Darby joined the sales department of Carnegie-Illinois in 1939 and that year was made district manager of sales in Philadelphia. He came to Pittsburgh in 1945 as general manager of sales for the company.

• **Dr. George Sachs,** director, research laboratory for mechanical metallurgy and professor of physical metallurgy, Case Institute of Technology, Cleveland, has been appointed director, National Metallurgical Laboratory, Jamshedpur, India. He will assume his new duties on Oct. 1.

• **Gilbert W. Chapman,** former president of the American Water Works Co., Inc., has been appointed vice-president in charge of finance of the Yale & Towne Mfg. Co., New York.

• **E. V. Murray** has been appointed manager of personnel and public relations of Atlas Steels Ltd., Welland, Canada. Mr. Murray has been an employee of Atlas Steels since 1935, first in charge of production planning, and for the past year he has been assistant to the general sales manager. He succeeds **D. G. Willmot,** who has resigned.

• **Robert M. Norton** has been appointed assistant sales manager of Hanson-Van Winkle-Munning Co., Matawan, N. J. Prior to his new assignment, Mr. Norton was engaged in sales promotion activities at Matawan.

• **Julius A. Kayser,** formerly assistant to the president, has been named resident vice-president and manager of Pacific Coast activities of Laclede-Christy Clay Products Co. with his offices in San Francisco. **William E. Daugherty** has been appointed district manager with offices at Los Angeles, and **Russell K. Wasmann,** district manager, San Francisco. **Walter Emes** has been appointed superintendent of the West Coast plant, now nearing completion at Warm Springs, Calif.

• **Clyde H. Slease** has been appointed labor counsel of Dravo Corp., Pittsburgh. He was formerly associated with the law firm of Paul, Lawrence & Wills. **Walter P. Barrett** has been named manager of the New York district office of Dravo. Formerly assistant manager of the corporation's machinery division district office in Philadelphia, Mr. Barrett has been with Dravo 13 years.

• **William T. Boyce** has been appointed assistant advertising manager of the Weatherhead Co. Cleveland. He comes to Weatherhead from American Steel & Wire Co., where he was first supervisor of advertising production and later assistant to the advertising manager.

• **Henry W. Rahn** has been appointed research and development director for Southern Alkali Corp.' Corpus Christi, Tex. plant. Mr. Rahn has been associated with Southern Alkali since 1934, and has been acting director of research and development during the past years.

• **Charles S. Holbrook,** employment manager, Worcester Presse Steel Co., Worcester, has resigned after 28 years with the company.

• **Walter H. Flynn** has joined the sales organization of the Lebanon Steel Foundry, Lebanon, Pa. He was formerly a sales and service engineer with Symington Gould Corp.

(CONTINUED ON PAGE 146)

The stamina that enables the fistic champion to win and hold his title comes from years of rugged physical conditioning. In the ring there is no lost motion in the champion's action . . . he avoids the more punishing blows . . . conserving his stamina for a whirlwind finish.

Illinois Gears likewise have an abundance of stamina; built into them through the experience of years in the production of finer gears. The gear blanks are critically inspected to verify that the steel meets specifications. Inspection follows every stage of production. The proper heat treatment gives the gears their optimum toughness for their specific job. The accuracy of Illinois Gears minimizes punishment . . . they function smoothly and silently through long periods of service.

Gears for Every Purpose

ILLINOIS GEAR & MACHINE COMPANY

CHICAGO 35, ILLINOIS

European Letter . .

• Main purposes of American and British foreign policy lost to sight since outbreak of war in Palestine . . . Irreparable damage to Anglo-American relations must be avoided.

LONDON — Suddenly, in the last few weeks, the coherence and good sense of Western diplomacy, which had increased steadily in the last year, have been shattered. Since Mr. Marshall's Harvard speech in 1947, a pattern of policy has been emerging in the Western world which carries with it the hope of stability and peace. It has aimed at the close collaboration of the United States with the 16 nations of Western Europe in European reconstruction. It has aimed at a concerted attitude towards Russia compounded of strength and reasonableness.

In all this, the fact has emerged more and more clearly that a close Anglo-American partnership is the condition of all the rest. Without it, there could be no genuine cooperation in Western Europe, no hope of a worldwide consolidation of the forces of free men. Since the outbreak of war in Palestine, a tornado of unreason has unleashed itself on the relations between Britain and the United States. In New York and in Congress strident voices accuse the British of every kind of perfidy for their supposed determination to back Arab against Jew. In Britain, the inevitable reaction of anger and obstinacy has set in and, as tempers rise and irrevocable things are threatened, the main purposes of both American and British foreign policy are lost to sight.

FOR let there be no doubt about the consequences of the present crisis. If it is allowed to develop unchecked, the Americans will raise their arms embargo in order to supply the Jews with weapons; and if Britain continues to fulfill its contracts to the Arabs and to maintain its special relationship with the military forces of King Abdullah, Britain and America will, in effect, be fighting each other by proxy in the Middle East. Such a situation will instantly affect the wider field of foreign policy. If the British and the Americans fight each other in Palestine, they will not collaborate anywhere else.

It may be that Zionist opposition can hardly prevent the passage of appropriations under the European Recovery Program this year. But there are three or four more appropriations to come before the full 4 years of the Plan are accomplished. Their chances would be slender indeed if the anti-British bitterness in New York and Washington were to be fanned month after month by a continuing "Anglo-American" war in Palestine. Under these conditions, the policy of rebuilding Western Europe would, of necessity, peter out. With equal necessity, a failure in Western Europe would end all hopes of collaboration in their continents.

Such an outcome to the present trend of events is at once so possible and so sinister that there can be only one aim in Anglo-American diplomacy—to stop the drift at all costs. It is obvious that President Truman is irresponsibly playing domestic politics. It is notorious that sections of the Foreign Office are strongly pro-Arab. But it is no use concentrating on these irrational factors if a crisis is to be checked which emotion and unreason have already carried almost beyond cure. The question now is not to decide who is right but how to avoid irreparable damage to Anglo-American relations.

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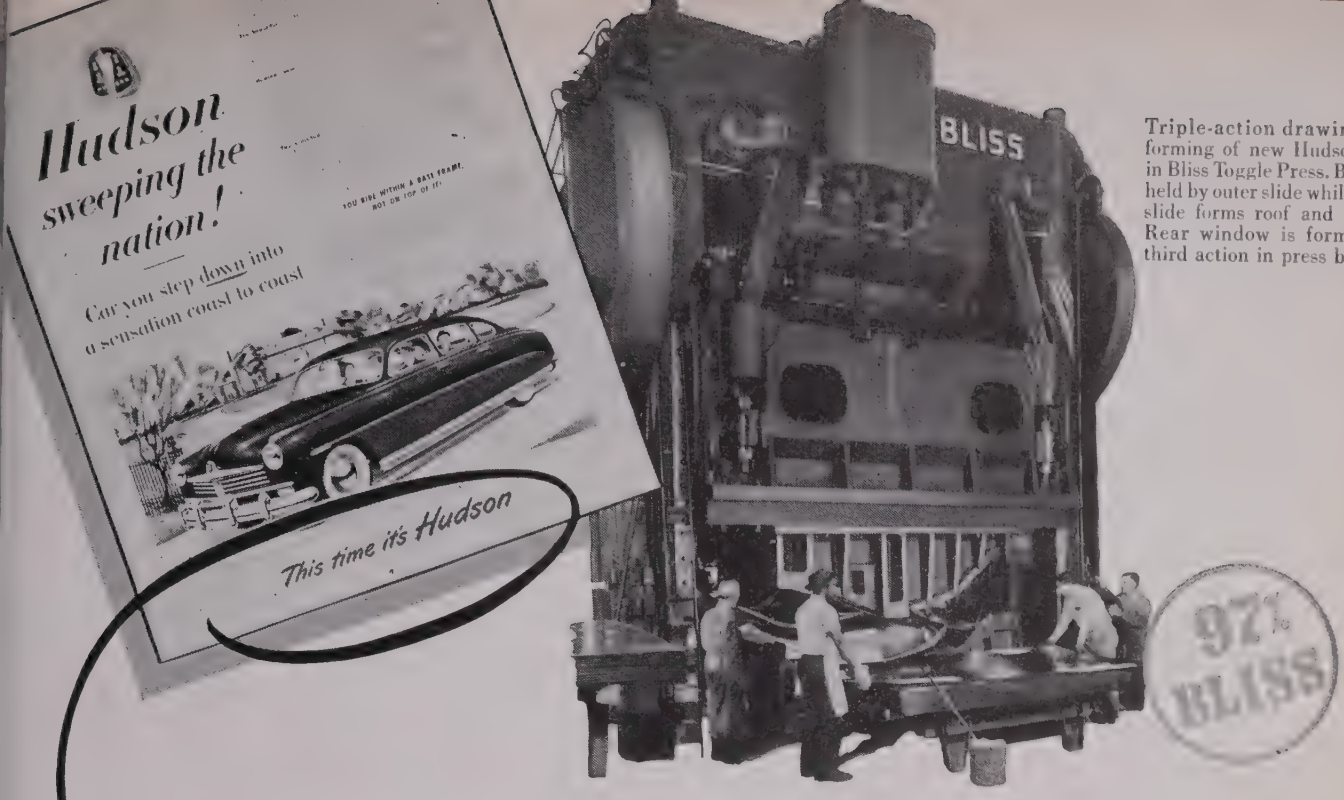
THE first problem is to enter into the closest and most direct consultation that can be achieved with the United States government. The national interest of the United States demands that the Arab lands, in which lie the world's oil reserves, strategic positions of vital importance, and landing rights of the great airways, should not be driven into implacable hostility. American officials are aware of the fact that their government has gone much too far and may, if a method of retreat is not worked out, find itself obliged to propose economic sanctions against the Arab States — thus jeopardizing Western Europe's oil supplies under ERP—and even to propose military action against the Arabs. There can be no doubt that a section at least of the American government is seeking to withdraw from its present exposed position. It is with this group that the British government can make its first efforts to retrieve the Palestine situation.

A second possible point of contact is at Lake Success. Opinion in this country underestimates the hold of the United Nations on the imagination of the American people, and probably the only way in which the volatile President could be constrained to pursue a consistent line would be if that policy had been worked out and agreed within the Security Council, and had on it the official stamp of the United Nations.

But even if there are points at which close consultation between Britain and America can be initiated, the question remains whether there is a single policy upon which both sides can agree. There appear to be only four possible outcomes in Palestine. The first is that Arab and Jew should negotiate and agree without outside intervention —which is ruled out. The second is that the Great Powers should intervene to impose a settlement. The third—the infinitely dangerous situation which exists today—is that the fighting will continue, different Great Powers supporting different sides as they did in Spain. The fourth is an agreed and vigorous attempt to localize the fighting, to prevent all outside intervention in the hope that, in the shortest space of time, a balance of forces will emerge in Palestine itself. Clearly it is only in this fourth alternative that any hope of an agreed Anglo-American policy can be sought.



Triple-action drawing and forming of new Hudson tops in Bliss Toggle Press. Blank is held by outer slide while inner slide forms roof and dwells. Rear window is formed by third action in press bed.

This time it's Hudson with 650 Bliss-Built Presses

From fender to top, just about every stamped part in a Hudson car is either blanked, formed, drawn or squeezed in one or more of the 650 Bliss-Built presses which total 97% of Hudson's entire press department.

"Bliss presses really stand-up under severe usage," says Hudson's master mechanic. "We've had them working 'around the clock' for several years during the war and since. Yet we've had little down-time due to press failure. They're simple to operate and maintain."

This overwhelming preference for Bliss equipment is duplicated in every pressed-metal-producing industry. It's because Bliss builds and delivers more than a press. Besides pioneering in press-construction improvements, Bliss provides a fund of engineering knowledge, going back over 90 years. "Bliss" on your press is more than a name—it's a guarantee. It will pay you to discuss your press problems with a Bliss press engineer.

Large and small end bosses on a forged connecting rod for a six-cylinder engine are compressed 3/64" in this 1200-ton Bliss-Toledo Knuckle Joint Press. Production averages 1133 per hour with an automatic chain-type feed.

Double action drawing of front fenders for the new Hudson also takes place in a Bliss-Toledo Toggle Press. Production averages about 180 per hour.

E. W. BLISS COMPANY, DETROIT 2, MICHIGAN

Mechanical and Hydraulic Presses, Rolling Mills, Container Machinery

WORKS AT: Toledo, Cleveland, Salem, Ohio; Hastings, Mich.; Englewood, N. J.; Derby, England; St. Ouen sur Seine, France. SALES OFFICES AT: Detroit, Hastings, Mich.; New York, Rochester, N. Y.; Cleveland, Dayton, Toledo, Salem, Ohio; Philadelphia, Pittsburgh, Pa.; Chicago, Ill.; New Haven, Conn.; Windsor, Ont.

BLISS · CONSOLIDATED · TOLEDO · MARQUETTE

BLISS BUILT

BLISS BUILDS MORE TYPES AND SIZES OF PRESSES THAN ANY OTHER COMPANY IN THE WORLD

Industrial News Summary...

- ***Public Interested in Being Sold***
- ***Outlook for Steel Shortage Same***
- ***Appliance Business Still Booming***

JOHN Q. PUBLIC has paid little attention to predictions of bad things to come. Nor is he currently interested in economic reports. Right now he wants a good product, is willing to pay for it and shows no signs of supporting a new crop of reports that a recession is coming. Maybe it will he thinks but not next month.

This frame of mind applies to buyers of steel. Their interest in prices, basing points and argument about demand-supply balance is purely academic. Nowhere has THE IRON AGE found an abundance of steel in consumers' hands. Everywhere it has been found that inventories are not relatively large, they are not near normal in many cases and customers are still screaming for steel supplies.

The screams will be louder in a few weeks when third quarter quotas become known. There will not be enough steel for those who say they need it. They will not be able to make all the things they say they have scheduled. The big questions are: "Is this real demand? Are things falling off and it is not apparent? Are inventories high? Are the prophets who have been three times wrong in the past 3 years going to finally make good this year or early next year?

At the risk of being wrong but with the promise that if that is so THE IRON AGE will be among the first to admit it—the steel situation this week looks as strong as it ever was; there is no sign of falling demand; things that looked easier a short time ago are tighter; customers will still be shouting for steel next Spring; steel prices may be higher next year; production will be at peak levels the rest of this year and longer except for possible coal strikes and finally when a falling off does come it will come suddenly without any warning except from those who have been warning since the end of the war.

TO double check on the steel situation a survey was made last week among large appliance manufacturers including mail order houses. If anything should have to be checked it is the consistent reports of an ailing and failing appliance market and demand. The IRON AGE editor making the check was flabbergasted at the results. He found no truth in reports that the appliance field was failing, that inventories were large and that sales were hard to make. What he found was (1) no appliance maker is getting the steel he wants, (2) there is no excess inventory in appliances except possibly hot water heaters and they are still moving, (3) sales forces are being used to sell the product being made which has picked up sales and created new backlogs, (4) the appliance field as a whole is roaring to a new high level but only because makers and distributors have found that the public will not buy unless it can be shown that the product is good, reasonably priced and is needed.

Thus the appliance story which has been dragged out ever so often to prove a new crisis in steel demand is just not true. When people stopped buying it was because they had to be shown the need for a good product and were not ready to rush out and buy a pig in a poke. Appliance makers have been the first to learn the costly lesson that products should be sold, plugged, made better and priced right. The resistance, say these manufacturers, was not due to lack of demand; it was due to lack of selling and failure to change the old idea that just becuase there were a few more models in store windows the jig was up.

What is true in appliances is true in other steel consumption groups. Auto makers, because of the coal strike, will be steel hungry for months to come. When changeovers are complete there will be reports of shutdowns because of steel shortages. The oil industry is still hard put to get anywhere near what it says it needs. Plates which were at one time looked on as a possible easy item are now as tight as sheets. The freight rate advance has cut off hundreds of users from regular sources in the past 2 years. These customers are "industrial orphans" wandering around the country trying to establish regular sources—at any cost. It is doubtful if many will get legitimate parents for some time to come.

WHAT about the steel industry's chance to ease things up a little. It is running everything it has without thought of when it will break down. Premium prices were paid for coal when the coal strike hampered output. Scrap is being hauled from long distances. Overtime is freely paid to keep maintenance to the point where equipment can be held at maximum output. Plans are being rushed for expansions—but the very steel demand which the industry is trying to fill is holding up delivery on new equipment. So the answer is that the industry will slowly but surely raise its sights and its output over the next year but not fast enough to seriously change the current spread between the supply and total demand.

It is silly to talk of steel expansion when enough raw materials can not be gathered together fast enough today to completely utilize what capacity the industry has. This week output is at 96.5 pct of capacity, up half a point from last week's revised rate of 96 pct. The outlook for enough scrap is not good. Reservoirs have been used up. During the war enough potential scrap to supply purchased scrap requirements for 8 years at current levels was shipped out of this country. Only a fraction of this will be returned over the next few years. Higher prices would not bring out any more scrap than is moving to mills now. As one scrap man said, "If scrap prices were high enough we could scrap the Empire State building but a $5 a ton increase in scrap prices would do little to make more scrap available.

• **NOT SO NEW**—Despite the publicity, fanfare and countless arguments, pro and con, attending the "new" GM wage pact, this type of agreement is not new in the field of labor-management relations. An almost identical plan has been in operation at the Shatterproof Glass Corp. (also at Detroit) for the past 13 months. Like the GM agreement, the Shatterproof formula links wages to the Detroit cost-of-living index of the Bureau of Labor Statistics. However, where GM will adjust wages every 3 months if necessary, Shatterproof and its subsidiaries adjust them every month. At Shatterproof the salaries shift 2¢ an hr each time the index fluctuates two points, while at GM the ratio is 1¢ for each 1.14 fluctuation in the index. Both agreements are for 2-year periods and both have guarantees below which salaries cannot be reduced during the life of the agreement.

• **FREIGHT CARS**—Domestic freight cars delivered during May totaled 9192, the sixth consecutive month that production has been maintained above 9000, according to the American Railway Car Institute. Deliveries for the past 6 months have averaged 9130 cars per month. Of May deliveries, 6651 were from the car builders and 2541 were built in railroad shops. Broken down according to types, deliveries were: 4416 hoppers, 2625 box, 957 gondolas, 635 refrigerator and 545 tank. New orders during the month totaled 2222 cars; 1861 to the car builders and 361 to be built in railroad shops. Cars on order as of May 31 totaled 127,681. The freight car production goal is 10,000 cars per month.

• **PROTEST**—Colorado Fuel & Iron Co. has protested to the Interstate Commerce Commission on the reduction of railroad freight rates on pig iron shipped from Geneva and Ironton, Utah, to Mid-Western points. The new rate of $10.63 per gross ton, as compared with the previous rate of $13.70 per gross ton, is scheduled to become effective June 26. Colorado Fuel & Iron Co. protested because its rate on pig to Chicago is now $11.87 per ton. The ICC is expected to resolve this conflict before the effective date. The reduced rate was requested primarily because Kaiser Co., Inc., purchasers of a surplus blast furnace at Ironton, is ready to ship to Eastern mills which will take 80 pct of the total output, according to the tariff filing agent for the petitioning Western railroads.

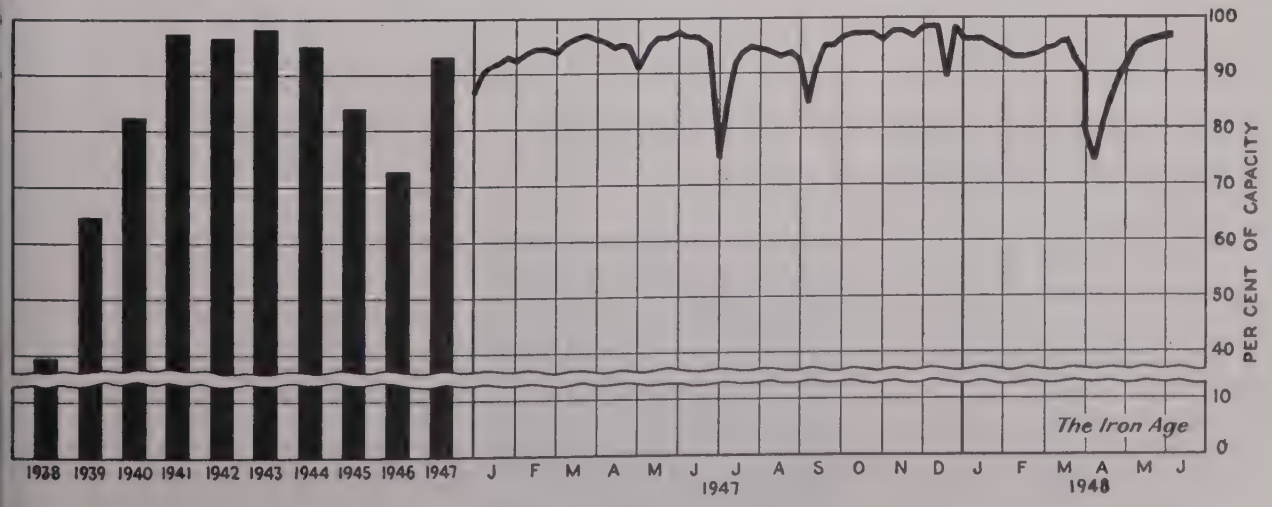
• **NEW COKE OVEN**—A new battery of 38 coke ovens will be built at Republic Steel Corp.'s Youngstown district steel plant. The new ovens will be built adjacent to the present coke plant, which is located near the Mahoning River. Construction will be undertaken by the Koppers Co. and work will begin later this month. The battery will be in production in June 1949. These ovens will be arranged in a single battery designed for coke oven gas firing. They will carbonize 878 tons of coal per day when operating at 17 hr coking time and based on coal at 50 lb per cu ft. When the new coke oven battery is ready for production some of the oldest existing ovens will be dismantled. Thus, overall coke production of Republic's Youngstown plant will not be greatly increased.

• **IN AND OUT**—The former war surplus blast furnace at Monessen, Pa., recently bought and completed by Pittsburgh Steel Co. is now in operation. Faint hopes of Pittsburgh foundrymen for merchant iron were dashed by announcement that materials shortages required another furnace to be blown out as the new one was started. Operation of all three furnaces is not expected until fall.

• **DISAGREES**—Lowell Mason, minority member of the Federal Trade Commission, disagrees with other commission members in interpreting the consequences of the Supreme Court decision on basing points in the Cement Case (see p. 106). He told the Senate Commerce Committee he believed any systematic pricing or freight absorption is illegal, even in the absence of conspiracy or agreement. Under present FTC procedure, he held, such action could be construed as restraint of trade and result in a cease and desist order.

• **ANOTHER OPENHEARTH**—Lloyd Steel Co., which has leased a war surplus openhearth furnace formerly operated by National Roll & Foundry Co. at Avonmore, Pa., poured its first ingot June 1. The new company, which has no connection with National Roll, converted the furnace from acid to basic practice to pour carbon steel ingots for several automotive companies. Production is reported to be 100 tons a day—none of it for sale on the open market. F. W. Specht is president, Karl Nuss, vice-president, C. W. Wolfe, secretary and Walker W. Stevenson is treasurer.

Steel Ingot Production by Districts and Per Cent of Capacity



Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
98.0* 98.5	95.5 95.5	92.5* 93.0	89.0 87.0	94.0* 94.0	93.0 93.0	93.0* 97.5	102.0 102.0	102.0 102.0	97.5 102.0	96.5* 99.0	85.0 89.5	98.0 98.0	96.0* 96.5**

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Long-Term Scrap Shortage Seen As Bar To Huge Steel Expansion

Those Demanding Big Program Said to Ignore Quantities Of Scrap Required

o o o

By GEORGE F. SULLIVAN
Pittsburgh Regional Editor

o o o

Pittsburgh

• • • **The additional** supply of scrap that would be needed to support a whopping expansion of steelmaking capacity is not in sight. This is the opinion of many well informed men who buy and sell steel scrap. With prospects for this year's scrap needs none too bright they argue that the 10 or 20 million-ton ingot capacity expansion program proposed by people outside the industry would fail. Considering no problem other than scrap supply they assert that prospects for a long-term domestic scrap shortage would almost certainly insure collapse of such a program.

Right now some big steel scrap buyers say they are not building up stocks fast enough to assure high operating rates throughout next winter. Other steel spokesmen claim they lost substantial tonnages of steel last year because of a shortage of scrap. Several responsible men on both the buying and selling end have asserted that at anything near present business levels scrap will get tighter rather than easier in the years ahead.

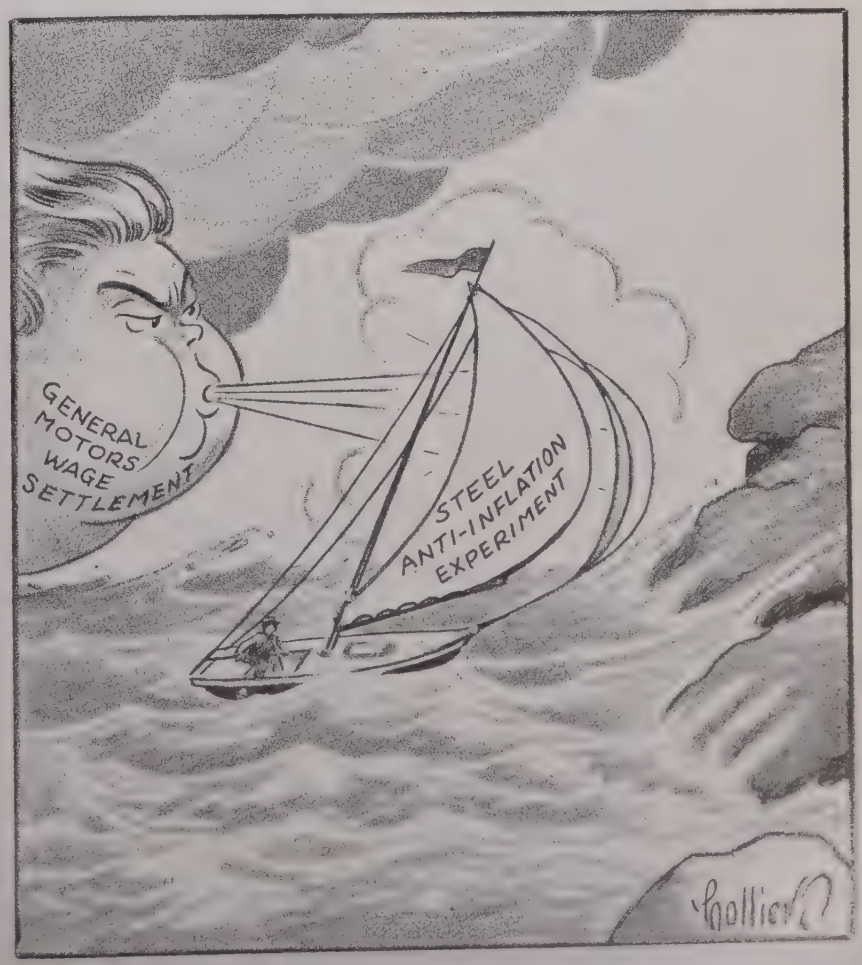
According to these people, the economists proposing a huge expansion of steelmaking capacity have overlooked the importance of obsolescence in scrap supply. Conceivably some other way to lick the problem may be found. If so it has not yet been brought to light.

It is estimated that only about a fourth of the 20 million gross tons of the scrap bought by steel mills last year was industrial scrap —that generated in industry as a waste product of steel fabricating. This leaves almost 15 million tons of purchased scrap that originated because things wore out or became obsolete. Of this about 2 million tons was war surplus— a non-recurring item. Even with this 2 million-ton windfall there were several recent cases of cold open-hearths due to insufficient scrap. Some additional war surplus scrap is looked for this year by the industry—it would help a lot now but it too will be a nonrecurring item, something that can't be counted on for the future.

To add to the prospects for less scrap ahead—to highlight the picture of a declining supply—it is estimated that during the war years 1941 to 1945 about 150 million tons of potential scrap were shipped overseas. At best, only a small portion of this will be returned to steel mills in this country. Yet it totaled almost 8 years' supply of purchased scrap at 1947 production rates.

In the past, scrap supplies tended to accumulate during periods of low steel operating rates. Some was exported (20 million tons between 1930 and 1940) some stored for use when melting rates picked up. Another long depression would permit supplies to build up again. For while the industrial 25 pct of total purchased scrap would fall off that arising from obsolescence would continue, though at a somewhat lower rate. This "obsolescence" scrap comes from worn out rails and railroad equipment, abandoned railroads, junked automobiles, farm, home and industrial machinery, old buildings and bridges. It continues in good times and bad with little regard for steel melting rates. It furnishes the backbone of the material that dealers and brokers sell to steel mills. It is generally believed that World War II scrap drives cleaned up most of the accumulated backlog of this material, though by now

"Thar She Blows"



some should again be building up.

It would appear that if a depression is necessary to cut steelmaking scrap demand to a point where supply is plentiful then at such a time the extra steel ingot capacity would be a white elephant. Those who reason this way add that if there is hardly enough scrap to meet demand at today's operating rates additional capacity will only mean less scrap per furnace.

There are some who argue that scrap will always be available at a price. This is simple economics. Today it is true but theoretical. A prominent scrap broker agrees with the theory. He declared that if mills would pay enough he'd scrap the Empire State Building. But he asserted that adding $5 or so a ton to going scrap prices would bring out little if any additional material in the United States.

Since VJ-Day the quality of scrap shipped to steel mills by dealers has been declining. Dealers say this is because most of the high quality material that normally moved as No. 1 or No. 2 heavy melting steel is being returned directly by industry to the mills. Mill buyers admit they receive heavy tonnages of earmarked scrap from their steel customers. What little heavy scrap can be picked up in the open market—scrap from railroads and wrecking jobs—commands a handsome premium. This, according to trade observers, adds weight to the declining scrap supply theory. They say it shows that demand today exceeds the rate of obsolescence.

Pig Iron Advisory Committee Approves Housing Allocation

Washington

• • • **The Pig Iron** Industry Advisory Committee has approved a voluntary allocation program calling for 110,000 to 128,000 tons of pig iron monthly for the manufacture of cast iron products for residential housing.

Pig iron will be made available during the remainder of this year and the first 2 months of next year to manufacturers participating in the program.

Types of cast iron housing products included in the proposed agreement are pressure pipe and/or fittings, soil pipe and/or fittings, radiation, boilers, castings for warm air furnaces, plumbing drainage products, castings for low water cut-offs and boiler feeders, castings for circulating pumps and built-in water heaters, relief and producing valves, gray and malleable iron screwed fittings, recess drains and iron body valves.

Producers of the above products originally asked for a monthly allocation of 158,325 tons. The Office of Industry Cooperation cut this to 128,683 and the Pig Iron Task Committee further cut it to 114,307 tons. The advisory committee finally agreed to an allocation calling for a minimum of 110,000 and a maximum of 128,000 tons. During 1947 these industries received an average of 108,335 tons a month.

OIC is particularly pleased with the program as worked out by the advisory committee, since for the first time substantial quantities of material will be allocated to so-called small business.

OIC officials stated at the meeting that all pig iron producers would be invited and encouraged to participate in the proposed voluntary agreement which is intended to provide sufficient pig iron to manufacture amounts of cast iron products necessary for (1) construction of new residential housing at the rate of 1,000,000 units during 1948, and at the same annual rate during the first 2 months of 1949, and (2) for essential maintenance and repairs of residential housing.

Major Ferroalloy Maker Starts Self Allocation

New York

• • • **A major producer** of ferroalloys has begun the self allocation of briquets of silicon, chromium silico-manganese and ferromanganese to foundry consumers. This development was made necessary by limited briquetting capacity to meet sharply increased foundry demand for alloys, coupled with a power shortage at producing plants that makes it necessary to work out production schedules appropriate to the long term needs of steel and foundry consumers. Foundry requirements for alloys have grown sharply in recent years due to the shortage of high silicon pig iron. Monthly shipments of 1200 tons of silicon briquets were once considered a high point, but if shipments were unrestricted it is estimated that demand would reach 6000 tons a month. Spot market customers will be affected at once, but contract custmoers will be protected for the duration of their contracts. Allocations are to be based on 1947 shipments, with some weighting to take care of marked increases in tonnages during the first half of 1948.

AMERICAN IRON AND STEEL INSTITUTE — **Blast Furnace Capacity and Production—Net Tons** — APRIL - 1948 (Month)

	No. blast furnaces reporting	Annual blast furnace capacity	Production: Pig Iron — Current month	Pig Iron — Year to date	Ferro Manganese and Spiegel — Current Month	Ferro Manganese and Spiegel — Year to date	Total — Current month	Total — Year to date	Percent of capacity — Current month	Percent of capacity — Year to date
DISTRIBUTION BY DISTRICTS:										
Eastern	11	13,093,560	649,516	3,415,277	24,646	104,564	674,162	3,519,841	62.7	81.3
Pittsburgh-Youngstown	17	25,588,120	1,404,839	7,294,502	18,391	98,091	1,423,230	7,392,593	67.8	87.4
Cleveland-Detroit	6	6,495,000	452,658	1,923,390	-	-	452,658	1,923,390	84.9	89.5
Chicago	7	14,700,290	882,615	3,897,048	-	-	882,615	3,897,048	73.2	80.2
Southern	8	4,949,660	268,674	1,400,752	6,029	30,120	274,703	1,430,872	67.6	87.4
Western	3	2,612,300	133,030	730,131	-	-	133,030	730,131	62.1	84.5
TOTAL	35	67,438,930	3,791,332	18,661,100	49,066	232,775	3,840,398	18,893,875	69.4	84.7

Batcheller's Down-To-Earth Speech Intrigues Purchasing Agents

New York

• • • **Hiland G. Batcheller,** president of Allegheny Ludlum Steel Corp., won a round of applause from more than 1500 leading industrial buyers when he declared "it cannot be denied that the steelmaker has underestimated market trends."

The occasion of Mr. Batcheller's remarks was the thirty-third annual international convention of the National Assn. of Purchasing Agents at the Waldorf Astoria Hotel last week.

Purchasing agents, who for more than 2½ years have been wrestling with steel procurement problems which have tested their ingenuity to the utmost, welcomed Mr. Batcheller's frank admission that "His [the steelmaker's] timing has been bad, and his public utterances have at times been unfortunate."

Mr. Batcheller asserted that while it has been fashionable to blame strikes for the shortage, they have been only a contributing factor. "There just has not been enough steel produced to meet the demand."

"None the less," he continued, "give the devil his due. While inadequate to meet your full demands, steel production has been sufficient to support the greatest employment and the greatest flood of capital and consumer goods in American history."

"It is rather simple for many steel consumers quickly to expand capacity in order to exploit a seller's market, sometimes with relatively little capital investment. But the producer of steel today must commit appalling sums of money—money he frequently doesn't have—for a program from which there can be no hope of return for several years and full amortization of which may well spread over the following 20 to 25 years.

"While the critics have been shooting, the steel industry has quietly and systematically (if somewhat belatedly) planned and initiated the installation of new steel making capacity totalling some 5½ million tons since the war's end, including of course, all the necessary auxiliaries such as coke plants, etc. This program when completed should bring total capacity up to about 96½ million ingot tons at the end of 1949.

Frank Talk on Steel Firms' Troubles Praised; Wolf Pleads for Trade

° ° °

"Whether this is enough or not is beside the point, because it appears to be the limit that could be supported by the necessary raw materials, and even the continuation of current operations for any sustained period will require the importation of increasing quantities of ore from resources mostly foreign, and as yet not developed.

"Just as we are entering a period of leaner and more costly ore supplies, it is becoming obvious that scrap supplies may never again be plentiful. Even as long ago as 1934, THE IRON AGE showed that the long-term trend in scrap supplies was inevitably downward. The war enormously accelerated this downward trend . . . Each ton of steel will require a much greater percentage of pig iron—and thus ore—than was the practice in prewar days.

"A cold-blooded analysis of the factors on which production depends (ore, scrap, coal) indicates actual production somewhat less than capacity figures.

"All this makes the outlook for the small non-integrated mill a rather bleak one. Such mills have customarily drawn their semifinished steel or pig iron from large integrated mills. They are being increasingly discouraged in this practice, and the near future will magnify their problems."

According to Mr. Batcheller, there is every probability that steel mills will become progressively larger, more complex and more costly. "Increased mechanization and the constant pressure to push labor productivity upward will demand larger productive units.

"One thing is certain. It already costs three and four times as much to construct a ton of ingot capacity as compared to prewar. There is every indication that the future will see even an additional rise rather than a decline. Therefore, the steel industry is no longer a place for an entrepreneur with a few million dollars. Rather, invested capital must be calculated in terms of hundreds of millions of dollars."

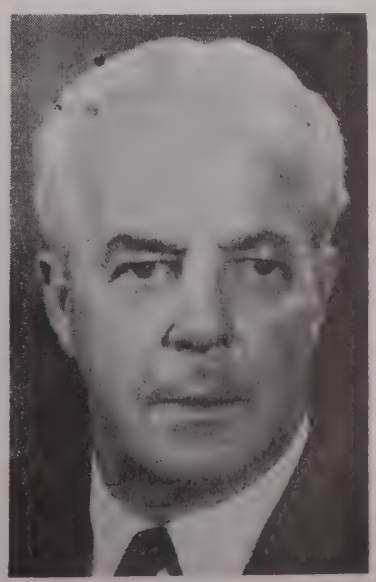
Mr. Batcheller told the purchasing agents that it would be wise to prepare for some entirely new problems in the purchase of steel, as a result of the Supreme Court's basing point decision in connection with the Cement case. He also asserted that the average consumer may expect some strange new prices if the same action involves the automobile industry, which sells on a "Detroit plus," or the multiplicity of other industries with selling practices ranging all the way from the equivalent of "Pittsburgh plus" to multiple basing points.

"In short, prepare yourselves for what some people like to refer to as 'anarchy in selling'."

Mr. Batcheller predicted that shortages of some steel products have yet to reach their height. At the same time, he pointed out that "Essential programs requiring steel, such as aid to the countries of Western Europe, mobilization, housing, atomic energy and freight cars must be fulfilled."

"We now have voluntary controls under Public Law 395. Whether

(CONTINUED ON PAGE [illegible])



HILAND G. BATCHELLER, president, Allegheny Ludlum Steel Corp., "talked turkey" to purchasing agents.

Industrial Briefs . . .

• SWISS MACHINES — Announcement has been made of a new sales organization for the distribution of Swiss jig boring machines and optical measuring instruments manufactured by Hauser Ltd. of Bienne, Switzerland. The new firm, Hauser Machine Tool Corp., is located at 74 Bournedale Road North, Manhasset, N. Y.

• NEW FIRM — Organization of Superweld Corp. to engage in brazing and in the manufacture of specialized metal products, has been announced. Superweld has purchased all furnaces and brazing equipment of Warner Welded Products and leased the building and additional land for parking and loading facilities at 708 Hawthorne St., Glendale, Calif.

• EXPANDS PLANT—Westinghouse Electric Corp. will boost production of large power transformers by building a 92,000-sq ft addition to its Sharon plant, according to a recent announcement. The building will be completed some time after the first of next year.

• PURCHASE—Apex Electrical Mfg. Co., Cleveland, has purchased all of the capital stock of Lake State Products, Inc., Jackson, Mich., producers of the Dish-A-Matic electric dishwashers and the Cinderella portable clothes washer. Lake State will be kept in operation as a wholly owned subsidiary of Apex.

• MARKING SYSTEM — To give tool and die steel users a quick, positive method of identifying steels of different grades, the entire surfaces of all matched tool and die steel bars are now being painted different colors, it was announced by the Carpenter Steel Co., Reading, Pa. A new tool steel selector and identification wall chart will be a further aid to selection and identification.

• HEADS NEW GROUP—Irving M. Footlik, instructor in materials handling engineering at Illinois Institute of Technology and a member of the engineering staff of Ekco Products Co., Chicago, has been elected president of the newly organized Midwest Materials Handling Society.

• BUYS ORE MINE—Sloss-Sheffield Steel & Iron Co., Birmingham, has bought an iron ore mine at Gadsden, Ala., from the Etowah Coal & Iron Co. The mine, now idle and flooded, will be investigated by Sloss-Sheffield for possible future operation after the water has been pumped out.

• BRANCH OFFICE — Bailey Meter Co., Cleveland, has opened a new branch office at Independence Bldg., Charlotte, N. C. The company designs, manufactures and applies measuring and controlling equipment.

• DISTRIBUTOR—Haskel Engineering & Supply Co., Glendale, Calif., has been appointed distributor for Parker Appliance Co., Cleveland and Los Angeles. They will handle the complete line of Parker tube fittings, valves and accessories for hydraulic and fluid handling systems.

• ACQUISITION — Manning, Maxwell & Moore, Inc., New York, has announced the acquisition of the Hydraulics Div. of the Airex Mfg. Co. located in Long Island City.

• MOVES — Federal Tool & Mfg. Co., manufacturer of short run stampings, has announced moving into their new plant at 3600 Alabama Ave., St. Louis Park, Minneapolis.

• SOUTHERN AGENTS—Atlas Chain & Mfg. Co., Phildelphia, has announced the appointment of H. H. Jarrett & Associates, Atlanta, as their southern representatives.

Purchasing Agents

(CONTINUED FROM PAGE 121)

those controls will continue to work depends upon the willingness and the desire of all of us to make them work . . . We must make them work, for our only other alternative is the creation of a peace-time WPB."

Another highlight of the convention was an address by George W. Wolf, president United States Steel Export Co. Mr. Wolf told the purchasing agents that imports are more beneficial to the economy of a nation than exports, contrary to a deeply-rooted common belief.

"We, as a nation, have succeeded to world economic leadership," Mr. Wolf said. "The method by which we discharge this obligation will depend in no small measure upon our willingness to accept world leadership, especially in the spheres of international finance and service. It is certain that we cannot go on lending if we are not to be repaid.

"Although loans of American money abroad may, at times, be essential to the overall world economy, including our own, they are not a substitute for domestic imports of services. . . . Often they delay the solution of problems instead of facilitating it."

Mr. Wolf declared that the optimum level in the enjoyment of wealth can be attained solely through imports of foreign commodities and services. "The prosperity of a nation is not measured by its accumulation of precious metals and currencies, but by the essentials . . . of life available to its people. Exports are of importance inasmuch as they help to provide the means for procurement of these essentials.

"Despite wishful expectations many of our foreign loans may never be refunded, because of the inability of the borrowers to honor their obligations.

"It is worth considering if it would not be preferable to extend financial assistance by purchasing abroad a larger amount of commodities, of which we could make tangible use, than by swelling the account of our receivable foreign assets; especially when our national resources begin to dwindle."

Mr. Wolf asserted that future imports would be important to this country (1) to keep our own economy strong and healthy and (2) to assure that world economy remains strong, healthy and expanding.

Consumers Goods Are Booming Along Toward Possible Record Year

Everyone Says Slow Up May Appear, But Said Same Thing a Year Ago

By D. I. BROWN
Chicago Regional Editor

Chicago

• • • **There is plenty** of difference of opinion about what has happened in the consumers goods market. Some have assumed, because a maker of automatic washing machines cut the price by $50 recently, that the pipelines on this item are full. Others who see a few refrigerators in a salesroom have come to the conclusion that dealers are holding excess stock which they cannot move. Does the fact that two makers of gas water heaters cut back their production mean all water heater demand countrywide has dried up?

In places the consumer goods market is spotty, but generally, the industry reported, business is booming along at a rate which may make this year a record year.

Three things have happened in consumers goods in the last year, which when understood help clarify the situation. Production of household items has shot up tremendously and has caught many makers and distributors with an antiquated, faulty and often a total lack of a rational distribution system.

The public has stopped the practice of almost swiping any item put on the floor in order to get it. Finally, most important is the fact that the quality and ability of retail salesmanship and the art of promotion in this field was allowed to sink to the lowest level the industry ever experienced.

Large retailers and sellers of goods have in the past year instituted costly sales training courses in the effort to bring their organizations back up to a satisfactory level. Small dealers for the most part are still wondering what happened, and have yet to realize that from now on a product must be sold, not merely handed out to the fellow at the top of the waiting list.

Experienced market men here point out that just because the supply of an item gets current with demand doesn't mean a cutback in production is necessary, or that the item cannot be sold. In evidence of these facts, a large maker of electric hot water heaters experimented. The market looked weak. Some of this plant's competitors had collected large inventories of finished goods which were not moving.

This plant decided to revert ever so slightly to the prewar selling practice just to see what would happen on their product, in which they had experienced some lag in sales. They did a little promotion, ran an advertising campaign which was very small by any prewar standards, and in a matter of weeks their inventories were all gone and a backlog had been accumulated.

The public, who for years has been accustomed to seeing bare salesrooms and have in cases purchased their refrigerators on the gray market, has assumed this market glutted the moment their neighborhood dealer exhibits a few models in the window.

Reliable officials of two large manufacturers of all types of household goods, plus a few dealer organizations, told THE IRON AGE that inventories of all items are not yet anywhere near normal. Sellers claim the factories still have them

MAJOR NEW APPLIANCE: The first assembly line on the only major postwar household appliance that has been developed. Assembly line is in the Hotpoint plant in Milwaukee, making automatic dishwashers.

on allocation on all types of goods except washing machines and water heaters.

Generally, refrigerator demand is still much higher than supply. All factories have their outlets on allocations except some of the smaller makers who make what the trade calls "off brands". Electric ranges appear second in tightness of supply. One large seller, however, told THE IRON AGE they were doing some promotional work on this line.

The demand for de luxe elctric ranges has tapered off somewhat with buyers reverting to cheaper models. In refrigerators this is not so. One maker of a two temperature refrigerator reports that this de luxe job is ordered ahead for the full year of their plant's current prdouction.

Opinions of the gas range market by the trade show some variation. Most factories are still allocating their production, but buyers don't have to wait too long to get a stove—this includes national brand names. The volume of washing machine sales continues upward. The automatic field continues competitive, but stocks are being moved. The price in this line seems to be more critical than elsewhere, retailers and manufacturers told THE IRON AGE.

The sales of home freezers have fallen off. This market is so new that the experts are still trying to evaluate it. Whether the freezer deal will show certain natural seasonal fluctuation is yet to be determined.

An ample production of water heaters is evident. One reason being that of all appliances it is one of the easiest and fastest to make. Many companies jumped into this market after the war, and some have since gone out of business. The acid test of having an ample, well trained dealer or selling organization is taking place in this field right now.

Although name brands are important to the buying public it appears that the reason such brands move depends just as much on the type and extent of the merchandising program as it does on the trade name itself.

All manufacturers of consumer goods contacted by THE IRON AGE report they are still screaming for steel. This includes the makers of washing machines and hot water heaters. Makers of parts for washing machines are still scheduled well ahead. Aluminum is still being used on deep drawn tub applications where steel cannot be had. Steel mills in Chicago report no cancellations or cutbacks from any manufacturers making household goods. Large producers of these items are still obtaining steel via the conversion route.

If and where the market falls off, steel supplies through this channel, the mill officials believe, will be the first to be cut. It appears that the talked of weakness in consumer goods is anything but here. Everyone concerned believes a general slow up may appear, but they said the same thing a year ago.

Coming Events

June 10-12 **National Steam Specialty Club,** annual meeting, Hot Springs, Va.

June 16-18 **Electric Metal Makers Guild,** annual meeting, Bethlehem.

June 21-25 **American Society for Testing Materials,** annual meeting, Detroit.

June 28-July 1 **American Electroplaters' Society,** Convention and Industrial Finishing Exposition. Atlantic City.

June 30-July 2 **Machinery Dealers National Assn.,** convention, French Lick Springs, Ind.

July 16-24 **American Road Builders' Assn.,** convention and Road Show, Soldier Field, Chicago.

July 26-27 Institute of Scrap Iron & Steel, midyear meeting, Atlantic City.

Aug. 30-Sept. 3 **American Chemical Society,** national meeting, Washington.

Sept. 6-10 **American Chemical Society,** national meeting, St. Louis.

Sept. 13-17 **American Chemical Society,** national meeting, Portland, Ore.

Form New Gray Iron Group

Buffalo

• • • **Gray iron** management executives representing foundries along the Niagara recently established a management group of Gray Iron Founders' Society. The group officers are: John H. Pohlman, president, Pohlman Foundry Co., Inc., Buffalo, chairman; E. B. Tuohey, secretary-treasurer, Niagara Foundry Co., Niagara Falls, vice-chairman, and Charles F. Bastien, secretary, Lake Erie Foundry Co., Buffalo, secretary-treasurer.

R. L. Collier, executive vice-president, Gray Iron Founders' Society, who spoke at the organizational meeting, described the society's national activities and important plans for future operations. He stressed the establishment of a technical department at society headquarters in Cleveland, which is slated for July.

Receives Honorary Degree

Cincinnati

• • • **C. R. Osborn,** vice-president of General Motors Corp. and general manager of its Electro-Motive Div. at La Grange, Ill., has been given an honorary degree of Doctor of Science by the University of Cincinnati. Mr. Osborn is a graduate of the University and is a product of the Cincinnati plan of cooperative technological education in which students spend alternating periods learning theory in campus classroom and laboratory and learning practical aspects in industry.

New Temper Numbers

New York

• • • **New temper** designations for wrought products are now being applied by all three aluminum producers. The new designations, initiated by Alcoa on Jan. 1, were developed in a move to bring the nomenclature of temper and physical characteristics of the metal into step with new metallurgical developments. The previous designations were based on the practice of tempering by strain hardening. Now aluminum products are rolled or drawn to full hardness, followed by an anneal to the desired hardness

Weekly Gallup Polls . . .

Voters Approve U.N. Control Over Atomic Energy

Princeton, N. J.

• • • **The weight of voter** opinion in America favors giving the United Nations control of atomic energy throughout the world, including power to inspect atomic plants in all countries, according to George Gallup, director, American Institute of Public Opinion.

A majority of voters with opinions would have this country continue to support the Baruch proposal for atomic control and inspection which the United States insists should be the first step rather than the immediate prohibition of atomic bombs wanted by the Soviet.

While discussions in the U.N. Atomic Energy Commission have bogged down completely, the issue was raised again in the open letter correspondence between Premier Stalin and Henry A. Wallace. Among the steps the third party presidential candidate said must be taken to achieve peace was the "outlawing of all methods of mass destruction," and Stalin's reply agreed that prohibition of atomic weapons must be effected.

Sentiment on the issue of control was tested by this question:

"Woud you favor or oppose having the U.N. adopt a plan for the control of atomic energy which would permit the U.N. to inspect atomic plants in the U. S. and any other country at any time?"

The answers:

	Pct
Favor control	43
Oppose control	39
No opinion	18

Willingness to have the United States submit to inspection by an international authority is general throughout the country, but proportionately more voters with college education favor the plan than those with fewer years of formal training.

As might be expected, voters who are dissatisfied with the progress recorded by U.N. thus far are less likely to approve a plan involving inspection of plants in this country than those who think the organization has done a satisfactory overall job.

Earlier polls have shown that voters want the U. S. to continue making atomic bombs but believe that other countries already have the knowledge necessary to make them also. The current survey means that voters are aware of the need for some kind of international controls, both to curb manufacture of bombs and to promote peaceful use of atomic energy.

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• • • **The latest survey** of public opinion on the issue of the military manpower reveals the following four facts:

(1) The weight of public opinion is in favor of Universal Military Training rather than a temporary draft. Although Congress has postponed consideration of UMT for the present, more than twice as many voters favor that program as favor the selective service draft.

(2) If there is to be a draft, the public thinks that 18 months, rather than the proposed 2 years, should be the limit.

(3) The majority of voters believe that young men in college should not be drafted until they have completed their schooling.

(4) Although the majority think that the $1000 bonus for 2 years' enlistment in the armed forces proposed recently by Congressman Leo E. Allen of Illinois, would get plenty of volunteers, the public is divided on whether this scheme would be a good idea. The proportion saying it is a good idea is outweighed by those saying it is a poor or only a fair idea.

The preference of voters for a permanent system of peacetime military training is hardly surprising in view of past surveys which have consistently found approval of the idea since the early days of World War II.

The testing of public opinion was conducted by the institute during mid-May as Congress was approaching decision on the manpower preparedness issue. The survey

Public Shows Preference For Universal Military Training Over Selective Service Draft

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covered several questions, as follows:

"If you had to choose between these two plans for building up U. S. military strength, which one would you choose?"

	Pct
(A) Requiring every able-bodied 18-year-old young man to take military or naval training for one year	55
(B) Drafting young men between the ages of 19 and 25 for 2 years' service in the armed services	22
Neither	11
Both	5
No opinion	7

The program of young men attending college was covered as follows in the survey:

"Do you think young men (19 to 25) in college should or should not be drafted for military service before they have finished their schooling?"

	Pct
Should	26
Should not	62
Qualified answers	6
No opinion	6

The proposal to entice young men into the forces by means of substantial bonus for volunteers was put to the public as follows:

"The armed services estimate that they need between 600,000 and 700,000 men. Do you think if the government paid a bonus of $1000 for 2 years' service—or about $40 a month more pay—that enough men would volunteer?"

	Pct
Yes	59
No	29
No opinion	12

"Do you think this is a good way or a poor way to get the men needed for the armed services?"

	Pct
Good way	42
Only fair	11
Poor way	38
No opinion	9

Canadian Steel Production and Shipments

Toronto

• • • Canadian production of primary iron and steel shapes for the month of March totalled 302,902 net tons as compared with 281,052 tons in February and with 282,545 tons for March 1947. Output for March included 285,453 tons of carbon steel shapes and 17,449 tons of alloy steel shapes. In the production figures for March are included 77,821 tons of shapes shipped to producers' own plants or plants within the primary industry for further processing.

Shipments for sale of primary iron and steel shapes in March amounted to 226,748 tons of which 210,106 tons were carbon steel shapes and 16,642 tons alloy steel shapes; in February shipments totalled 203,779 tons and included 191,630 tons of carbon and 12,149 tons of alloy steel shapes, and for March 1947, shipments amounted to 216,393 tons including 206,873 tons of carbon and 9,520 tons of alloy steel shapes. The above figures which show iron and steel shapes for sale do not include deliveries for further processing.

The following table shows production and shipments for sale of primary iron and steel shapes for the month of March in net tons:

March 1948	Carbon Steel Made	Carbon Steel Shipped	Alloy Steel Made	Alloy Steel Shipped
Billets, etc., for forging	7,427	6,019	4,425	4,226
Other semi-finished shapes, not for rerolling by makers	36,155	78	618	.....
Structural shapes and piling	14,788	14,895	.....	.....
Plates	17,790	18,265	555	380
Rails	24,437	25,350	.....	.....
Tie plates and track material—				
Splice bars	2,932	3,519	.....	.....
Tie plates	5,550	5,402	.....	.....
Spikes	1,332	1,270	.....	.....
Concrete Reinforcing bars	5,310	5,344	.....	.....
Hot rolled bars for cold finishing	1,010	.....	.....	.....
Other hot rolled bars	41,832	34,994	9,437	9,680
Pipes and tubes	14,500	13,152	.....	.....
Wire rods	27,501	20,158	32	93
Hot rolled black sheets	22,796	19,643	.....	.....
Cold reduced black sheets	3,918	3,581	.....	.....
Galvanized sheets	8,183	7,955	.....	.....
Steel Castings	8,650	8,567	1,898	1,707
Miscellaneous hot rolled products	23,795	4,475	238	321
All other products	17,557	17,439	246	235
TOTAL	285,453	210,106	17,449	16,642

Producers' shipments of primary iron and steel shapes subdivided according to principal consuming industries for the month of March in net tons, follow:

Industry	Carbon steel	Alloy Steel
Automotive industries	6,365	6,555
Agricultural, including farm machinery	7,927	421
Building construction	25,124	163
Containers industry	17,947	1
Machinery and tools	10,177	748
Merchant trade products	25,346	167
Mining, lumbering, etc.	5,731	686
National defense	98	1
Pressing, forming and stamping	13,970	106
Public works and utilities	1,368	53
Railway operating	38,779	275
Railway cars and locomotives	18,221	608
Shipbuilding	5,079	14
Miscellaneous and unclassified	957	145
Wholesalers and warehouses	28,972	535
Direct export (a) to British Empire	2,837	2,460
(b) to Other Countries	1,208	3,704
TOTAL SHIPPED FOR SALE	210,106	16,642
Producers' interchange	77,203	618

Construction Steel . .

• • • Fabricated steel awards this week included the following:

10,687 Tons, Kingman, Ariz, transmission towers for U. S. Bureau of Reclamation Specification 2165 to American Bridge Co., Pittsburgh.

9000 Tons, Denver, Col., steel towers and appurtenances for Davis Dam-Hoover Dam; Davis Dam-Prescott; and Prescott-Phoenix 230 kv transmission lines, Divis Dam Project, Bureau of Reclamation Spec. 2165, to American Bridge Co., Pittsburgh.

3700 Tons, Collingswood, N. J., four apartment houses, Sylvester A. Lowery, to American Bridge Co., Pittsburgh.

1000 Tons, Iowa City, Iowa, laboratory for the University of Iowa to American Bridge Co., Pittsburgh.

900 Tons, Delaware County, Pa., bridge, Pennsylvania Dept. of Highways, to Phoenix Bridge Co., Phoenixville, Pa.

850 Tons, Astoria, L. I., N. Y., gas generator house for Consolidated Edison Co., through United Engineers & Constructors, Inc., Philadelphia, to American Bridge Co., Pittsburgh.

450 Tons, Clifton, N. J., bridge on route S-3, through Franklin Construction Co., to Bethlehem Steel Co., Bethlehem.

450 Tons, Plainsboro, N. J., bridge for Pennsylvania R.R., rhtough Brann & Stuart Co., Philadelphia, to American Bridge Co., Pittsburgh.

280 Tons, Chipewa County, Wis., bridge section to 284 State of Wisconsin through L. G. Arnold Co. to Bethlehem Steel Co., Bethlehem.

270 Tons, Lake County, Ill., state highway bridge section 59F to American Bridge Co., Pittsburgh.

260 Tons, Allovez, Wis., ore dock repair Great Northern Ry. Co. to American Bridge Co., Pittsburgh.

250 Tons, Cook County, Ill., highway bridge section 2425-1HF to American Bridge Co., Pittsburgh.

230 Tons, Newnan, Ga., factory building for Richardson Co. through Freevol-Smedberg & Co. to Calvert Iron Works.

220 Tons, Westchester, Pa., Deny Tag Co. building, to Bethlehem Fabricators, Inc., Bethlehem.

195 Tons, Lichfield, Ill., state highway bridge section 117-1VM to Illinois Steel Bridge Co., Jacksonville, Ill.

190 Tons, Cook County, Ill., state highway bridge section 2626-1HF to American Bridge Co., Pittsburgh.

140 Tons, Outagamie County, Wis., bridge section S03841 for State of Wisconsin to Bethlehem Steel Co., Bethlehem.

100 Tons, Denver, Col., discharge pipe bends for Granby pumping plant, Bureau of Reclamation, Denver, Spec. 2177, to Pacific Coast Engineers.

• • • Fabricated steel inquiries this week included the following:

375 Tons, Millville, N. J., bridge, New Jersey Dept. of Highways, June 24.

280 Tons, Cape May Courthouse, N. J., memorial hospital, plans being revised.

220 Tons, Cook County, Ill., bridge section 0707-1HF State Highway Dept.

200 Tons, Cook County, Ill., state highway bridge 0606—1HF State Highway Dept.

150 Tons, Woodford County, Ill., state highway bridge section 32R-F State Highway Dept.

• • • Reinforcing bar inquiries this week included the following:

195 Tons, Solano County, Calif., bridges between Ledgewood Creek and 3.5 miles east of Fairfield, California Div. of Highways, Sacramento.

145 Tons, San Diego County, bridges near Escondido, California Div. of Highways, Los Angeles, bids to June 24.

110 Tons, Klamath Falls, Ore., structures, Lost River channel, Klamath Project, Bureau of Reclamation, Klamath Fals, Spec. 2263, bids to June 30.

Detroit Consumers Worry More About Output Than Paying Freight

Detroit

• • • **Reports circulating** here last week that a possible swing to 100 pct selling of cold-drawn steel on an f.o.b. basis would create havoc in Detroit's screw machine and cold heading industries appear to be premature if not inaccurate.

"We'll cross the bridge of higher steel prices when we come to it," a leading producer told THE IRON AGE. "We're now buying half our steel, including alloy, on an f.o.b. basis and the prospect of paying more freight on incoming steel is definitely ahead of us. Right now, however, our shop is well fitted with orders and we have little time to think about the cost picture of the future. And even if we wanted to find out what our steel is going to cost us," this source continued, "no one seems to be able to answer our questions about steel prices.

"All we do today is order the steel. When we get the bill, then we find out what the steel is going to cost," he explained.

Other steel customers here have indicated that the price of cold-drawn steel in Detroit today is in a highly confused state. Most suppliers are selling alloy grades on an f.o.b. basis. The trade is divided in its policies on carbon grades but a Cleveland base, it is reported, is frequently used. Some suppliers are still selling on the arbitrary in effect earlier this year. Others are using the 21¢ arbitrary which reflects the recent rise in freight rates. In Bay City, it is reported, three different arbitrary prices are being used by various steel suppliers.

While the policies of the larger suppliers appear to be reasonably uniform under the circumstances, other suppliers have failed to develop a clear cut policy about absorbing freight charges, according to some sources.

"We gave up trying to figure out our freight charges in advance," one prominent firm reported. "Some of our suppliers are asking us to pay all freight charges. Another supplier asks us to pay the freight and sometimes, but not always, offers us a rebate if the shipment is sent by rail. If the shipment arrives by truck, the policy may be entirely different. Our chief complaint at the moment is that practices of a number of suppliers are not consistent or uniform either by product or location. As a result, our cost estimates are sometimes wide of the mark and this has led to difficulties in quoting our customers."

Cold-Drawn Steel Prices Are Reported Confused By Freight Policies

By WALTER G. PATTON
Detroit Regional Editor

The possibility that purchasers of cold-drawn material would be particularly hard hit by a crackup of the basing point system apparently stemmed from the knowledge that material costs ordinarily constitute a large and critical part of production costs.

A typical producer of bolts in this area, for example, has reported that material costs make up as much as one third of the sales dollar. The high ratio is accounted for, in part, by the fact that selling expense is unusually low in the Detroit screw machine and cold heading industries. The number of customers is relatively few, including only GM, Ford, Chrysler, the independent auto producers and a few parts suppliers. Another factor is that most of the products of these plants are delivered in or near Detroit, hence there is seldom a problem about absorbing large amounts of freight in distribution costs.

Hardest hit by increased freight costs will undoubtedly be the screw machine operators whose scrap losses are considerably greater than those of a manufacturer of cold-headed products.

This week's survey indicated that while cold-drawn steel buyers here are well aware of the threat to the existing basing point system, the details of the Cement Case and its possible repercussions are only vaguely familiar. While recognizing that sizable variations in steel costs could result if the basing point system is thrown out, all company spokesmen reported the possibility of charging different prices to different customers based on variations in steel prices will hardly be given serious consideration.

"At the present time," one source told THE IRON AGE, "we are paying four different prices for the same product. Half of our steel is being bought on an f.o.b. basis, with some being shipped from Pittsburgh, some from Cleveland and some from Chicago. Although we are today experiencing substantial variations in our steel costs, we do not anticipate that these variations will become large enough to make us consider a multiple pricing system for the particular products we sell."

BELL TOP: Here is a new 21-ton bell for National Tube's Lorain, Ohio, blast furnace. Changes like these take only a fraction of the time consumed several years ago.

Reports Europeans Have Little Information on Tools Under ECA

• • • **Incomplete information** and some of the political aspects of the situation are menacing machine tools for European countries under ECA, according to J. Herbert Myers, vice-president and sales manager, Lodge & Shipley, Cincinnati.

Back from a 10-week tour of Europe, one purpose of which was to get first-hand information, Mr. Myers declared that "people over there don't know, and if some concerted effort isn't made, it is possible that machine tools may still be left out."

Mr. Myers, who visited England, France, Switzerland, Belgium, Denmark, Sweden, Italy, and parts of occupied Germany, said industrialists in those countries, with the exception of Germany, are looking to ECA with a great deal of hope but little information.

"Europe is potentially an excellent market for U. S. machine tools, if the proper dollar exchange can be set up," he added.

He pointed out that all countries outside the sphere of Russian influence want U. S. machine tools, and in fact, most of the countries that formerly sought their machine tool requirements in Germany are now looking to the U. S. as the source.

"Strange as it may seem, England is potentially a good market for U. S. machine tools," Mr. Myers revealed, "because England is exporting everything possible, even at the expense of domestic machine tool requirements. If England devoted all available machine tool production to home use there would still be a shortage."

He indicated that France is also a very good market and has people in Washington at the present time doing everything possible to see that French requirements get the proper attention.

Elsewhere, major segments of the machine tool industry, faced with the prospect of a seasonally quiet summer, are looking forward to the third and fourth quarters when the initial tentacles of the government machine tool buying bonanza are expected to take hold.

Sees Good U. S. Tool Market If Appropriate Dollar Credit Is Set Up

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With the possible exception of ECA's $122 million (which is still if and when), sources close to the machine tool industry and to Washington believe that none of the services' programs are going to achieve anything approaching the stature originally indicated. In other words, the AAF is not going to buy anything remotely resembling 265,000 machine tools, which is about one third of the machine tools it took this nation to win World War II. On the other hand, the AAF program is going to be a very large one.

As matters stand at the moment, machine tool builders are likely to get the start of the AAF program, a few orders here and there, before the summer is over, but very likely nothing of any size will come through until late this year.

For ECA, it is not likely that this business will show up in any shape or form for 3 or 4 months, and more than likely not until the last quarter. Speedy solution to personnel and procedure problems at ECA headquarters would probably help.

In the meantime, there has been no change on the blocked orders held up by State and Commerce Depts., fate of which many segments of the industry are awaiting with pardonable degree of anxiety. Capital observers allege that legislation will probably be required to clarify the situation, and an election year is a bad time.

On more prosaic fronts, business during May was pretty spotty in major sectors, with the exception of Chicago, where trade reports indicate that orders are coming in. In Cleveland business has been only fair, and in Detroit spotty, due largely to the absence of any general buying by the automobile industry. Summer is here.

Dealers in the East were very pessimistic over the volume of May business and forecast for June an equally low level based on the small number of inquiries that have been coming in. A mid-May increase in the price of Swiss jib borers built up an unhealthy demand for this item from one dealer here. So far there has been no evidence of early orders for the tooling of the two aircraft plants in the northeast, Pratt & Whitney or Wright Aeronautical.

It is reported that propellers, even of the old type, are in short supply, and it is believed that the first evidence of retooling activity may come from the propeller plants. Some tools have been ordered for the atomic plant at Burlington, Va., that General Electric Co. is building.

At present there has been no change in the dollar supplies of Latin American nations, nor is there any program in immediate prospect for granting U. S. funds to these countries, and the curtailment of buying has grown more acute.

In Detroit the trend in the industry is mixed. Some builders of special equipment report their backlogs are largely whittled away, although there are indications that orders are being placed here in substantial volume for equipment to be used for plant modernization and product improvement.

At the moment, no large tooling orders are reported by any major producer, most recent placement being a substantial order for grinding equipment for Reo. Informed sources estimate that orders already placed may equal about half the entire tooling program at the Lansing truck plant.

Investigation shows that any holdups on Chrysler tooling program during the recent strike were insignificant and some sources indicate that actually replacements were made during the 17-day work stoppage. General Motors, it is reported, has under consideration a substantial tooling program for the Chevrolet transmission plant at Saginaw and quotations for modernization of the Ford tool room are being prepared.

Cast Grades Show Slight Softness

New York

• • • **Receipts and shipments** continue at reasonably high levels in most districts. Some lessening of demand in steelmaking scrap was observed in the Pittsburgh market and was attributed to continuation of the seasonal increase in supply.

Cast grades were off in price somewhat in most of the districts. Demand for these items continues to be firm for the quality material, but foundry inventories are such that the run of the yard material is not being fought over. No. 1 machinery scrap was off $3 in Chicago and the secondary grades in Buffalo showed an identical drop even though top grade cupola cast held firm there at $65.

The freight rate increase has made some consumers reconsider pricing on remote material. Midwestern mills are reportedly haggling on dealers' prices for Southwest scrap. Ship scrap from the Gulf area, at least that contracted for by Carnegie, is still moving, however.

Steel mill and foundry officials, who have been making no bones about their dissatisfaction with the progress being made in returning overseas scrap, suggested last week that a trade agreement to bring in some Japanese material be worked out. One steel executive said Japan has 3.5 million tons readily accessible and suggested that a trade agreement swapping coking coal for scrap be arranged.

Regarding this proposal, observers have pointed out that it would be considerably cheaper to import German scrap—if it can be freed—and that the estimate of the Japanese supply is uncertain. At any rate, the recommendations of the industry group have been placed before a subcommittee of the Economic Commission for Europe.

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PITTSBURGH — Some of the smaller consumers who were paying a little over formula prices for occasional lots appear to be easing off to the formula basis in the face of seasonal increase in suppy. May was reported unusually good from the shipment viewpoint. Cast iron scrap orders picked up during the past week and one large consumer came back into the market, buying for 50¢ less than the former price. No. 1 cupola cast is now quotable at $63 to $64.50, and malleable is off $1 to $76 to $77. However, railroad specialties were stronger on the basis of th latest list and are now quoted at $55 to $56.

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CHICAGO—Mills report shipments are still good, but receipts have fallen off compared to the peak of the spring rush back about the middle of April. The freight rate increase made the mills shorten their remote hauls. One mill reports that West Texas and New Mexico scrap is out unless the dealers lower their prices. Ship scrap is still reaching Carnegie here from the Gulf area. The tonnage is not large, but shipments have been very steady. Specialty items continue to bring premium prices some of which take the scrap away from this area. The Milwaukee movement of scrap via boat to Detroit and Canada is reported to have dried up.

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PHILADELPHIA—There were no price changes in openhearth or blast furnace grades last week. The low phos market is stronger and is quoted at $48.00 to $49.00 on the basis of current sales. The cast market continues strong. Shipments are continuing at a high level, but yards and brokers report incoming scrap has fallen off sharply.

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CLEVELAND — There has been no change in the market here. Openhearth material is moving at formula, and while mills have plenty on the ground, they continue to take all they can get. While there is some inclination to get the market below formula prices, most consumers of openhearth material are hesitant to attempt any market-breaking tactics. A possible factor in this is the recent offering of overseas scrap. Cast which looked as though it was going to weaken considerably, has strengthened in the last few days and is moving at quoted prices.

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DETROIT—With Detroit mills reported to be in perhaps the most comfortable position for scrap since the war and collections at the year's highest levels, it would be natural to anticipate a bearish tone in the Detroit scrap market. However, the apparent desire of some mills to continue to build up their inventory has thus far offset any tendency toward market weakness. Cast grades are reported easier this week although an isolated sale of No. 1 automotive cast at $70 has been reported.

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BUFFALO—The market was quiet this week and everything pointed to increasing dullness until after the July 4 holiday. Several large factories that supply scrap locally notified dealers of plans to close from June 26 to July 6, which will further curtail the limited flow. Two Pittsburgh district interests were buying downstate on springboards of $1 to $1.50 a ton, but rejections were heavy. Foundries cut their bids on run of yard cast scrap at $60, but No. 1 cupola was fairly steady at $65. Between 4000 and 5000 tons of mill scrap are scheduled to arrive by barge from New York City before the end of the month. The cargos will be the first canal shipments of the season. In addition a 5000 ton shipload from Duluth arrived by lake late last week.

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BIRMINGHAM—The scrap market in this area shows little change in trend although consumers are showing an increased reluctance to pay the prices being asked for cast grades. Openhearth material is moving freely. Prices are firm generally.

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NEW YORK—Market activity stayed much the same except for some easiness in cast grades, with the major foundries apparently being comparatively comfortably fixed. The premium price of $36.50 to $37.50 for genuine No. 1 heavy melting material is firm with movements to eastern Pennsylvania continuing.

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CINCINNATI—Cast, particularly mixed, is softer. Demand has dropped off considerably and although foundries are willing to pay quoted prices for good material, some have dropped their price on mixed from $3 to $5 a ton. Some foundries are out of the market entirely at the present time. Rails are a drug on the market, according to some sources, and are showing an increasing tendency toward price softness. Openhearth material is at formula and moving fairly well at the moment.

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BOSTON—A definite weakness in the cast market continues, with prices possibly stabilized for the time being, but with the outlook extremely dull. Brokers say they do not expect any real business until the middle of August. Foundries have become much choosier in demanding stricter specifications. They show little desire for stove plate, and are increasing their rejections of other forms of cast. The latest range for No. 1 machinery cast appears to be $54.50 to $57.50, a new low for the current downtrend.

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ST. LOUIS—Memorial day lapse tended to slow down shipments and further reductions in the movement are expected as a result of seasonal changes. Market continues firm.

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages.

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. melting	$40.00 to $40.50
RR. hvy. melting	41.00 to 41.50
No. 2 hvy. melting	40.00 to 40.50
RR. scrap rails	55.50 to 56.50
Rails 2 ft and under	62.50 to 63.50
No. 1 comp'd bundles	40.00 to 40.50
Hand bdld. new shts	40.00 to 40.50
Hvy. axle turn.	41.50 to 42.00
Hvy. steel forge turn	41.50 to 42.00
Mach. shop turn	35.50 to 36.00
Shoveling turn.	38.00 to 38.50
Mixed bor. and turn	35.50 to 36.00
Cast iron boring	38.00 to 38.50
No. 1 cupola cast	63.00 to 64.50
Hvy. breakable cast	52.00 to 53.00
Malleable	76.00 to 77.00
RR. knuck, and coup	55.00 to 56.00
RR. coil springs	55.00 to 56.00
RR. leaf springs	55.00 to 56.00
Rolled steel wheels	55.00 to 56.00
Low phos.	47.50 to 48.00

CHICAGO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$39.00 to $39.50
No. 2 hvy. melting	39.00 to 39.50
No. 1 bundles	39.00 to 39.50
No. 2 dealers' bundles	39.00 to 39.50
Bundled mach. shop turn.	37.00 to 37.50
Galv. bundles	35.00 to 35.50
Mach. shop turn.	34.00 to 34.50
Short shov turn.	35.50 to 36.50
Cast iron borings	36.00 to 37.00
Mix. borings & turn.	34.00 to 34.50
Low phos. hvy, forge	48.00 to 50.00
Low phos. plates	45.00 to 46.00
No. 1 RR. hvy. melt	41.25 to 41.75
Rerolling rails	53.00 to 54.00
Miscellaneous rails	51.00 to 52.00
Angles & splice bars	53.00 to 54.00
Locomotive tires, cut	54.00 to 55.00
Cut bolster & side frames	49.00 to 51.00
Standard stl. car axles	59.00 to 60.00
No. 3 steel wheels	51.00 to 52.00
Couplers & knuckles	54.00 to 55.00
Rails, 2 ft and under	56.00 to 57.00
Malleable	76.00 to 78.00
No. 1 mach. cast	69.00 to 70.00
No. 1 agricul. cast	60.00 to 63.00
Heavy breakable cast.	51.00 to 52.00
RR. grate bars	60.00 to 65.00
Cast iron brake shoes	58.00 to 59.00
Cast iron carwheels	58.00 to 59.00

CINCINNATI

Per gross ton delivered to consumer:

No. 1 hvy. melting	$38.50 to $39.50
No. 2 hvy. melting	38.50 to 39.50
No. 1 bundles	38.50 to 39.50
No. 2 bundles	38.50 to 39.50
Mach. shop turn.	33.00 to 33.50
Shoveling turn.	35.00 to 35.50
Cast iron borings	32.50 to 33.00
Mixed bor. & turn	32.50 to 33.00
Low phos., plate	46.00 to 48.00
No. 1 cupola cast	63.00 to 64.00
Hvy. breakable cast	53.00 to 54.00
Rails 18 in. & under	60.00 to 61.00
Rails random length	50.00 to 51.00
Drop broken	66.00 to 68.00

BOSTON

Dealers' buying prices, per gross ton, f.o.b. Boston

No. 1 hvy. melting	$31.65 to $31.90
No. 2 hvy. melting	31.65 to 31.90
Nos. 1 and 2 bundles	31.65 to 31.90
Busheling	31.65 to 31.90
Shoveling turn.	.... 28.90
Machine shop trun.	.... 26.90
Mixed bor. & turn	.... 26.90
Cl'n c st chem. bor	38.00 to 39.00
No. 1 machinery cast	54.50 to 57.50
No. 2 machinery cast	53.50 to 55.00
Heavy breakable cast	52.50 to 53.00
Stove plate	52.00 to 52.50

DETROIT

Per gross ton, brokers' buying prices f.o.b. cars:

No. 1 hvy. melting	.... $35.50
No. 2 hvy. melting	.... 35.50
No. 1 bundles	.... 35.50
New busheling	.... 35.50
Flashings	.... 35.50
Mach. shop turn.	$29.00 to 29.50
Shoveling turn.	30.00 to 30.50
Cast iron borings	30.00 to 30.50
Mixed bor. & turn.	28.50 to 29.00
Low phos. plate	39.50 to 40.50
No. 1 cupola cast	53.00 to 56.00
Heavy breakable cast.	48.00 to 52.00
Stove plate	48.00 to 50.00
Automotive cast	55.00 to 57.00

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. melting	$42.00 to $43.00
No. 2 hvy. melting	38.50 to 39.00
No. 1 bundles	42.00 to 43.00
No. 2 bundles	38.50 to 39.00
Mach. shop turn.	34.50 to 35.00
Shoveling turn.	34.50 to 35.00
Mixed bor. & turn	34.50 to 35.00
Clean cast chemical bor.	42.00 to 44.00
No. 1 machinery cast	66.00 to 68.00
No. 1 mixed yard cast	62.00 to 63.00
Hvy. breakable cast.	63.00 to 64.00
Clean auto cast.	65.00 to 66.00
Hvy. axle forge turn	44.00 to 45.00
Low phos. plate	48.00 to 49.00
Low phos. punchings	48.00 to 49.00
Low phos. bundles	46.00 to 47.00
RR. steel wheels	52.00 to 53.00
RR. coil springs	52.00 to 53.00
RR. malleable	75.00 to 78.00
Cast iron carwheels	68.00 to 70.00

ST. LOUIS

Per gross ton delivered to consumer:

No. 1 hvy. melting	$41.00 to $42.00
No. 2 hvy. melting	37.50 to 38.50
Bundled sheets	37.50 to 38.50
Mach. shop turn.	33.00 to 33.50
Locomotive tires, uncut	46.00 to 47.00
Mis. std. sec. rails	46.50 to 47.50
Steel angle bars	50.00 to 51.00
Rails 3 ft and under	52.00 to 53.00
RR. steel springs	48.50 to 49.50
Steel car axles	54.00 to 55.00
Grate bars	59.00 to 60.00
Brake shoes	57.00 to 58.00
Malleable	71.00 to 72.00
Cast iron car wheels	61.00 to 62.00
No. 1 machinery cast	65.00 to 67.00
Hvy. breakable cast	58.00 to 59.00

BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy, melting	.... $37.50
No. 2 hvy, melting	.... 37.50
No. 2 bundles	.... 37.50
No. 1 busheling	.... 37.50
Long turnings	$25.00 to 26.00
Shoveling turnings	27.00 to 28.00
Cast iron borings	26.00 to 27.00
Bar crops and plate	42.50 to 43.50
Structural and plate	42.50 to 43.50
No. 1 cupola cast.	64.00 to 67.00
Stove plate	55.00 to 58.00
No. 1 RR. hvy, melt.	38.50 to 40.00
Steel axles	38.00 to 39.00
Scrap rails	44.00 to 45.00
Rerolling rails	51.00 to 53.00
Angles & splice bars	51.00 to 53.00
Rails 3 ft & under	52.00 to 55.00
Cast iron carwheels	48.00 to 50.00

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. melting	$40.00 to $40.50
No. 2 hvy. melting	40.00 to 40.50
Mach. shop turn.	35.00 to 35.50
Short shov. turn.	37.00 to 37.50
Cast iron borings	36.00 to 36.50
Low phos.	45.00 to 45.50

NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$36.50 to $37.50
No. 2 hvy. melting	.... 34.50
No. 2 bundles	.... 34.50
Mach. shop turn.	29.00 to 29.50
Mixed bor. & turn.	29.00 to 29.50
Shoveling turn.	31.00 to 32.00
No. 1 cupola cast	55.50 to 56.50
Clean auto cast	55.50 to 56.50
Hvy. breakable cast	55.00 to 56.00
Charging box cast	55.00 to 56.00
Unstrp. motor blks	52.00 to 53.00
Cl'n cast chem. bor	34.50 to 35.50

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy, melting	$39.75 to $45.00
No. 2 hvy. melting	.... 39.75
No. 1 bundles	.... 39.75
No. 2 bundles	.... 39.75
No. 1 busheling	.... 39.75
Mach. shop turn.	34.75 to 35.00
Shoveling turn.	35.00 to 36.00
Cast iron borings	.... 35.75
Mixed bor. & turn	.... 34.75
No. 1 cupola cast	64.00 to 65.00
Mixed cupola cast	60.00 to 61.00
Charging box cast	56.00 to 57.00
Stove plate	60.00 to 61.00
Stove auto cast	60.00 to 61.00
RR. malleable	70.00 to 75.00
Small indl. malleable	47.00 to 49.00
Low phos. plate	44.75 to 46.00
Scrap rails	50.00 to 52.00
Rails 3 ft & under	57.00 to 58.00
RR steel wheels	51.00 to 52.00
Cast iron carwheels	51.00 to 52.00
RR. coil & leaf spgs	51.00 to 52.00
RR. knuckles & coup	51.00 to 52.00

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. melting	$39.50 to $40.00
No. 2 hvy. melting	39.50 to 40.00
No. 1 bundles	39.50 to 40.00
No. 1 busheling	39.50 to 40.00
Drop forge fiashings	39.50 to 40.00
Mach. shop turn.	34.50 to 35.00
Shoveling turn.	35.50 to 36.00
Steel axle turn.	39.50 to 40.00
Cast iron borings	35.50 to 36.00
Mixed bor. & turn.	35.50 to 36.00
Low phos.	44.50 to 45.00
No. 1 machinery cast.	65.00 to 70.00
Malleable	73.00 to 75.00
RR. cast.	70.00 to 73.00
Railroad grate bars	60.00 to 62.00
Stove plate	60.00 to 62.00
RR. hvy. melting	40.00 to 40.50
Rails 3 ft & under	60.00 to 61.00
Rails 18 in. & under	62.00 to 63.00

SAN FRANCISCO

Per gross ton f.o.b. shipping point:

No. 1 hvy. melting	.... $25.00
No. 2 hvy. melting	.... 25.00
No. 2 bales	.... 25.00

Per gross ton delivered to consumer:

No. 3 bales	.... $19.50
Mach. shop turn.	.... 16.00
Elec. furn. 1 ft under	$32.00 to 34.00
No. 1 cupola cast	40.00 to 43.00
RR. hvy. melting	.... 26.00

LOS ANGELES

Per gross ton f.o.b. shipping point:

No. 1 hvy. melting	.... $25.00
No. 2 hvy. melting	.... 25.00
No. 1 bales	.... 25.00
No. 2 bales	.... 25.00
No. 3 bales	.... 19.00
Mach. shop turn.	.... 17.50
No. 1 cupola cast.	$45.00 to 50.00
RR. hvy. melting	.... 26.00

SEATTLE

Per gross ton delivered to consumer:

No. 1 & No. 2 hvy. melt	.... $26.00
Elec. furn. 1 ft and under	.... 30.00
No. 1 cupola cast	.... 40.00
RR. hvy. melting	.... 28.00

HAMILTON, ONT.

Per gross ton delivered to consumer: Cast grades f.o.b. shipping point.

Heavy melting	$22.00
No. 1 bundles	22.00
No. 2 bundles	21.50
Mechanical bundles	20.00
Mixed steel scrap	19.00
Mixed borings and turnings	17.00
Rails, remelting	23.00
Rails, rerolling	26.00
Bushelings	17.00
Bushelings, new fact, prep'd	21.00
Bushelings, new fact, unprep'd	16.00
Short steel turnings	17.00
No. 1 cast	$42.00 to 46.00
No. 2 cast	35.00 to 37.00

•Ceiling Price.

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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

NONFERROUS METALS

. . . News and Market Activities

Tin Price Set At $1.03

New York

• • • **Grade A tin** has been increased by 9¢ per lb to a price of $1.03 by the Reconstruction Finance Corp. effective June 1. The action was taken after the British Ministry of Supply had announced an increase of £50 per long ton in its buying and selling prices for Malayan and Nigerian tin effective the same date. The increase of British tin prices was the equivalent of 9¢ per lb at the current rate of exchange. This action will be followed by an automatic increase in the U. S. buying price of Bolivian concentrates, tied to the price of Straits tin delivered at New York, to 99¢ per lb of tin content.

The Tin Sales Corp., selling agency of RFC, will release June contracts in the next few days calling for the new prices. Other grades of tin are priced as follows: Grade B, $1.028; C, $1.024; D, $1.024 for tin contained; E, $1.02 contained; F, $1.15 contained; G, 99¢ for tin contained.

The new British buying prices are £554, smelters' works in Malaya, and £535/ 10s f.a.s. Nigerian ports. The selling price for Malayan tin is £555/ 10s smelter. F.o.b. United Kingdom ports or delivered to UK consuming plants, the new price is £569 a long ton.

Some members of the trade believe that the latest price increase may serve to discourage the use of tin for some applications, such as collapsible tubes and solder.

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Orders Flood Anode Maker

New York

• • • **Plating suppliers** are being swamped with orders for nickel and since the announcement of the rearmament program, are attempting to build up their inventories before an allocations program of any type gets under way. Despite the sharp rise in the volume of orders for cadmium anodes, plating suppliers and cadmium producers say there is no shortage of the metal at its current price. Production is well above domestic demand at this time. An anode manufacturer who produces nickel-cobalt anodes is now working out techniques required for casting anodes containing 80 pct cobalt and 20 pct nickel. These are to be used to deposit the alloy on red brass wire for use in electronic computing machines.

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Phosphor Bronze Prices

New York

• • • **Officials of the** leading producers of phosphor bronze mill products were holding company meetings last week to determine whether it would be necessary to increase their prices for these products as a result of the 9¢ rise in tin. At week end no decision had been arrived at by any producer. The crux of the matter is whether the market can stand a further increase in the price of phosphor bronze products above their present high levels. If a price increase is cadmium anodes, a situation contrary to the normal summer experience. Last summer the industry went along with practically no order volume. With a rapidly growing order backlog, the industry has been restricted as to its supply of nickel by the producer to the same pattern of shipments as in 1947. Platers, who have been expecting curtailment of nickel distribution found to be necessary, leadership in the action will be taken by the mills specializing largely in these alloys. The more widely diversified mills whose production of non-tin-containing products is much greater do not have as much at stake in the pricing of phosphor bronzes, as any losses there can be absorbed by their other products. Officials of several of these mills have stated that they would initiate no action toward a price increase at this time. However it is more than probable that they would follow action taken by the phosphor bronze producers.

•

Raise Bronze Ingots

• • • **Ingot producers** announced price increases last week in bronze ingots containing tin ranging from ¼¢ to 2¢ per lb depending on the tin content. There were no price changes made in principal grades of brass ingots. Buying prices for copper and brass scrap were not affected by this development. Ingots in the 88-10-2 group were advanced from ½¢ to 2¢ per lb. Ingots in the 80-10-10 group were increased from ½¢ to 1½¢. Some grades in the 85-5-5-5 group were raised from ¼¢ to 1¢, but principal grades were unchanged. Ingot grades 420, 421 and 422 were raised 1¢ a lb.

•

Zinc

• • • **World market** prices for zinc are well above domestic prices as indicated by the following export prices prevailing at Gulf and eastern ports: Prime Western, 12.875¢; High Grade, 13.75¢; SHG, 14.00¢. These prices were the result of sharp advances during the week and are well above domestic prices of comparable grades. Should further advances in export prices develop over the next few weeks there, is a real probability of an increase in the domestic market. Domestic consumers are having difficulty in obtaining all their requirements in any grade.

Nonferrous Metals Prices

	June 2	June 3	June 4	June 5	June 7	June 8
Copper, electro, Conn.	21.50	21.50	21.50	21.50	21.50	21.50
Copper, Lake, Conn.	21.625	21.625	21.625	21.625	21.625	21.625
Tin, Straits, New York	$1.03	$1.03	$1.03	$1.03	$1.03	$1.03
Zinc, East St. Louis	12.00	12.00	12.00	12.00	12.00	12.00
Lead, St. Louis	17.30	17.30	17.30	17.30	17.30	17.30

Primary Metals

(Cents per lb. unless otherwise noted)

Aluminum, 99+%, 10,000 lb, f.o.b shipping point, freight allowed	15.00
Aluminum pig, f.o.b. shipping point	14.00
Antimony, American, Laredo, Tex.	35.00
Beryllium copper, 3.75-4.25% Be dollars per lb contained Be	$20.50
Beryllium aluminum 5% Be, dollars per lb contained Be	$40.00
Cadmium, del'd	$1.75
Cobalt, 97-99% (per lb)	$1.65 to $1.72
Copper electro, Conn. Valley	21.50
Copper, lake, Conn. Valley	21.625
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$105 to $115
Lead, St. Louis	17.30
Lead, New York	17.50
Magnesium, 99.8+%, f.o.b. Freeport, Tex.	20.50
Magnesium, sticks, carlots	34.50
Mercury, dollars per 76-lb flask, f.o.b. New York	$75 to $77
Nickel, electro, f.o.b. New York	36.56
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$98 to $101
Silver, New York, cents per oz.	74.625
Tin, Grade A, New York	$1.03
Zinc, East St. Louis	12.00
Zinc, New York	12.65
Zirconium copper, 20 pct Zr, per lb contained Zr	$8.75

Remelted Metals

Brass Ingot

(Cents per lb, in carloads)

85-5-5-5 ingot	
No. 115	19.00–19.25
No. 120	18.50–18.75
No. 123	18.00–18.25
80-10-10 ingot	
No. 305	25.25
No. 315	22.25
88-10-2 ingot	
No. 210	31.00
No. 215	29.00
No. 245	23.25–23.75
Yellow ingot	
No. 405	15.25–16.00
Manganese bronze	
No. 421	19.00

Aluminum Ingot

(Cents per lb, lots of 30,000 lb)

95-5 aluminum-silicon alloys	
0.30 copper, max.	21.75
0.60 copper, max.	21.50
Piston alloys (No. 122 type)	20.00
No. 12 alum, (No. 2 grade)	19.75
108 alloy	20.00
195 alloy	19.75
13 alloy	21.50
AXS-679	20.00

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95 pct.-95½ pct.	20.50–21.00
Grade 2—92 pct-95 pct.	19.50–20.00
Grade 3—90 pct-92 pct.	19.00–19.50
Grade 4—85 pct-90 pct.	18.50–19.00

Electroplating Supplies

Anodes

(Cents per lb, f.o.b. shipping point in 500 lb lots)

Copper, frt. allowed	
Cast, oval, 15 in. or longer	37⅝
Electrodeposited	32⅜
Rolled, oval, straight, delivered	33.09
Brass, 80-20, frt. allowed	
Cast, oval, 15 in. or longer	33⅜
Zinc, cast, 99.99	20.50
Nickel 99 pct plus, frt. allowed	
Cast	51
Rolled, depolarized	52
Silver 999 fine	
Rolled, 1000 oz lots per troy oz.	67¼

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	44.00
Copper sulfate, 99.5, crystals, bbls.	12.50
Nickel salts, single, 425 lb bbls. frt. allowed	15.50
Silver cyanide, 100 oz. lots, per oz.	54.00
Sodium cyanide, 96 pct domestic, 100 lb drums	15.00
Zinc cyanide, 100 lb drums	35.00
Zinc sulfate, 89 pct, granules, bbls, frt. allowed	7.90

Mill Products

Aluminum

(Base prices, cents per pound, base 30,000 lb., f.o.b. shipping point, freight allowed.)

Flat Sheet: 0.188 in., 2S, 3S, 24¢; 4S, 61S-O, 25.8¢; 52S, 27.7¢; 24S-O, 24S-OAL, 26.7¢; 75S-O, 75S-OAL, 32.7¢. 0.081 in.; 2S, 3S, 25¢; 4S, 61S-O, 27.1¢; 52S, 29¢; 24S-O, 24S-OAL, 27.7¢; 75S-O, 75S-OAL, 34.3¢. 0.032 in.; 2S, 3S, 26.4¢; 4S, 61S-O, 30.1¢; 52S, 32.6¢; 24S-O, 24S-OAL, 34.2¢; 75S-O, 75S-OAL, 43.1¢.

Plate: ¼ in. and heavier; 2S, 3S, 21.2¢; 4S-F, 23.2¢; 52S, 24.2¢; 61S-O, 23.8¢; 24S-F, 24S-FAL, 24.2¢; 75S, 75S-AL, 30.5¢.

Extruded Solid Shapes: Shape factors 1 to 4; 31¢ to 59¢; 11 to 13, 31.9¢ to 69c; 23 to 25, 33.4c to 90¢; 35 to 37, 40.8¢ to $1.25; 47 to 49, 58.7¢ to $1.84.

Extruded Round Rod, Square, Hex, Octagonal Bar: ¼ in. and over, 27¢ to 38¢; ½ to ¾ in., 28¢ to 40.5¢; ⅜ to ½ in., 29c to 43c; ¼ to ⅜ in., 30¢ to 46.5¢; 7/16 to 5/16 in., 32.5¢ to 53.5¢; 9/64 to 5/32 in., 35.5¢ to 62¢.

Rolled Rod: 1.064 to 4.5 in., 2S, 3S, 30¢ to 26.5¢; Cold-finished rod, 0.375 to 3.5 in., 2S, 3S, 32¢ to 28¢.

Screw Machine Stock: Drawn, ⅛ to 1½ in., 11S-T3, R317-T4, 45¢ to 34¢; cold-finished, ⅝ to 1⅜ in., 11S-T3, 33¢ to 31¢; ⅜ to 2 in., R317-T4, 33¢ to 30¢; rolled, 1⅝ to 3 in., 11S-T3, 31¢ to 28.5¢; 2⅛ to 3⅜ in., R317-T4, 29.5¢ to 28.5¢. Base 5000 lb.

Drawn Wire: coiled, 0.051 to 0.374 in.; 2S, 33¢ to 24¢ 52S, 40.5c to 29c; 56S, 42.5¢ to 34.5¢; 17S-T4, 46¢ to 31¢; 61S-T4, 41c to 30.5c; 75S-T6, 66¢ to 46¢.

Magnesium

(Cents per lb, f.o.b. mill, freight allowed. Base quantity 30,000 lb.)

Sheet and Plate: Ma. FSa. ¼ in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58c-60c; 10, 59c-61c; 12, 63-65c; 14, 69c-74c; 16, 76c-81c; 18, 84c-89c 20, 96c-$1.01; 22, $1.22-$1.31; 24, $1.62-$1.75. Specification grade higher.

Extruded Round Rod: M, diam. in., ¼ to 0.311, 58¢; ½ to ¾, 46¢; 1¼ to 1.749, 43¢; 2½ to 5, 41¢. Other alloys higher.

Extruded Square, Hex. Bar: M, size across flats, in., ¼ to 0.311, 61¢; ½ to 0.749, 48¢ 1¼ to 1.749, 44¢; 2½ to 4, 42¢. Other alloys higher.

Extruded Solid Shapes, Rectangles: M, in weight per ft, for perimeters of less than size indicated, 1.00 to 0.11 lb. per ft, per. up to 3.5 in., 55¢; 0.22 to 0.25 lb per ft, per. up to 5.9 in., 51¢; 0.50 to 0.59 lb per ft, per. up to 8.6 in., 47¢; 1.8 to 2.59 lb per ft, per. up to 19.5 in., 44¢; 4 to 6 lb per ft, per. up to 28 in., 43¢. Other alloys higher.

Extruded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057, ¼ to ⅛ $1.14; ⅛ to ⅜, $1.02; ½ to ⅝, 76¢; 1 to 2 in., 65¢. 0.065 to 0.082, ⅜ to ⅛, 85¢; ⅝ to ¾, 62¢; 1 to 2 in., 57¢. 0.165 to 0.219, ⅝ to ¾, 54.5¢; 1 to 2 in., 53¢; 3 to 4 in., 49¢. Other alloys higher.

Nickel and Monel

(Cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	54	43
No. 35 sheets		41
Strip, cold-rolled	60	44
Rod		
Hot-rolled	50	39
Cold-drawn	55	44
Angles, hot-rolled	50	39
Plates	52	41
Seamless tubes	83	71
Shot and blocks		31

Copper, Brass, Bronze

(Cents per pound, freight prepaid on 200 lb)

	Extruded Shapes	Rods	Sheets
Copper	33.53	....	33.68
Copper, hot-rolled	....	30.03	....
Copper, drawn	....	31.03	....
Low brass	34.36*	31.39	31.70
Yellow brass	32.92*	29.85	30.16
Red brass	34.89*	31.92	32.23
Naval brass	30.28	29.03	34.97
Leaded brass	28.64	24.69	....
Commercial bronze	35.68*	32.96	33.27
Manganese bronze	33.87	32.37	38.47
Phosphor bronze, 5 pct	53.95*	52.95	52.70
Muntz metal	29.80	28.55	32.99
Everdur, Herculoy, Olympic, etc.	37.24	37.50	38.56
Nickel silver, 10 pct.	41.80	42.68	40.54
5 pct	....	....	38.98
Architectural bronze	28.61	....	....

*Seamless tubing.

Scrap Metals

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 15,000 lb or more.)

	Heavy	Turnings
Copper	19⅛	18⅝
Yellow brass	15⅝	14⅝
Red brass	17⅛	16⅝
Commercial bronze	17⅝	16⅞
Manganese bronze	15¼	14⅝
Leaded brass rod ends	15¾	....

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery.)

No. 1 copper, wire	18.50
No. 2 copper, wire	17.50
Light copper	16.50
Refinery brass	16.50–16.75*

*Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer.)

No. 1 copper, wire	18.25
No. 2 copper, wire	17.25
Light copper	16.25
No. 1 composition	14.50
No. 1 comp. turnings	14.00
Rolled brass	11.00
Brass pipe	11.25
Radiators	12.00
Heavy yellow brass	10.50
Aluminum	
Mixed old cast	11.50
Mixed old clips	11.50
Mixed turnings, dry	11.00
Pots & pans	12.00
Low copper	12.50

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound.)

Copper and Brass

No. 1 heavy copper and wire	16½—17
No. 2 heavy copper and wire	15½—16
Light copper	14¼—14¾
Auto radiators (unsweated)	9¾—10¼
No. 1 composition	12½—13
No. 1 composition turnings	12 —12½
Clean red car boxes	9½— 9¾
Cocks and faucets	9½—10
Mixed heavy yellow brass	8 — 8⅛
Old rolled brass	9½— 9¾
Brass pipe	10 —10¼
New soft brass clippings	12¼—12¾
Brass rod ends	10 —10½
No. 1 brass rod turnings	9½—10

Aluminum

Alum. pistons with struts	6 — 6½
Aluminum crankcases	8¾— 9
2S aluminum clippings	10 —10½
Old sheet & utensils	9 — 9½
Dry borings and turnings	3½— 4
Misc. cast aluminum	8½— 9
Dural clips (24S)	8½— 9

Zinc

New zinc clippings	8 — 8½
Old zinc	6 — 6½
Zinc routings	3 — 3½
Old die cast scrap	4 — 4½

Nickel and Monel

Pure nickel clippings	17 —18
Clean nickel turnings	13 —14
Nickel anodes	17 —18
Nickel rod ends	17 —18
New Monel clippings	12 —13
Clean Monel turnings	8 — 9
Old sheet Monel	10 —10½
Old Monel castings	7½— 8
Inconel clippings	9 —10
Nickel silver clippings, mixed	8 — 8⅛
Nickel silver turnings, mixed	6½— 7

Lead

Soft scrap lead	15½—16
Battery plates (dry)	9¾— 9½

Magnesium Alloys

Segregated solids	8 — 9
Castings	4½— 5½

Miscellaneous

Block tin	81 —83
No. 1 pewter	65 —67
No. 1 auto babbitt	50 —52
Mixed common babbitt	14¼—14¾
Solder joints	19 —19½
Siphon tops	50 —52
Small foundry type	17½—18
Monotype	16¼—16¾
Lino. and stereotype	15½—16
Electrotype	13½—14
New type shell cuttings	14½—15
Hand picked type shells	6½— 7
Lino and stereo dross	8 — 8½
Electro dross	6 — 6½

Comparison of Prices . . .

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

Steel prices on this page are the average of various f.o.b. quotations of major basing points: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel: (cents per pound)	June 8, 1948	June 1, 1948	May 11, 1948	June 10, 1947
Hot-rolled sheets	2.775	2.775	2.775	2.50
Cold-rolled sheets	3.495	3.495	3.495	3.20
Galvanized sheets (10 ga.)	3.913	3.913	3.913	3.55
Hot-rolled strip	2.775	2.775	2.775	2.50
Cold-rolled strip	3.535	3.535	3.535	3.20
Plates	2.93	2.93	2.93	2.65
Plates wrought iron	7.25	7.25	7.25	5.95
Stain's c-r strip (No. 302)	30.50	30.50	30.50	30.50
Tin and Terneplate: (dollars per base box)				
Tinplate (1.50 lb) cokes..	$6.70	$6.70	$6.70	$5.75
Tinplate, electro (0.50 lb)	5.90	5.90	5.90	5.05
Special coated mfg. ternes	5.80	5.80	5.80	4.90
Bars and Shapes: (cents per pound)				
Merchant bars	2.875	2.875	2.875	2.60
Cold-finished bars	3.483	3.483	3.483	3.20
Alloy bars	3.213	3.213	3.213	3.05
Structural shapes	2.767	2.767	2.767	2.50
Stainless bars (No. 302)	26.00	26.00	26.00	26.00
Wrought iron bars	8.65	8.65	8.65	6.15
Wire: (cents per pound)				
Bright wire	3.608	3.608	3.608	3.30
Rails: (dollars per 100 lb)				
Heavy rails	$2.725	$2.725	$2.725	$2.50
Light rails	3.05	3.05	3.05	2.85
Semifinished Steel: (dollars per gross ton)				
Rerolling billets	$45.00†	$45.00†	$45.00†	$42.00
Slabs, rerolling	45.00†	45.00†	45.00†	42.00
Forging billets	54.00†	54.00†	54.00†	50.00
Alloy blooms, billets, slabs	66.00	66.00	66.00	61.00
Wire Rods and Skelp: (cents per pound)				
Wire rods	3.133	3.133	3.133	2.55
Skelp	2.888	2.888	2.888	2.35

† Net ton

Pig Iron: (per gross ton)	June 8, 1948	June 1, 1948	May 11, 1948	June 10, 1947
No. 2, foundry, Phila.	$44.85	$44.85	$44.85	$36.51
No. 2, Valley furnace	39.50	39.50	39.50	33.50
No. 2, Southern Cin'ti.	45.47	45.47	43.97	34.75
No. 2, Birmingham	39.38	39.38	37.38	29.88
No. 2, foundry, Chicago†	39.00	39.00	39.00	33.00
Basic del'd Philadelphai.	44.35	44.35	44.35	36.92
Basic, Valley furnace	39.00	39.00	39.00	33.00
Malleable, Chicago†	39.50	39.50	39.50	33.50
Malleable, Valley	39.50	39.50	39.50	33.50
Charcaol, Chicago	65.55	65.55	62.55	45.99
Ferromanganese‡	145.00	145.00	145.00	135.00

† The switching charge for delivery to foundries in the Chicago district is $1 per ton.
‡ For carlots at seaboard.
* Revised.

Scrap: (per gross ton)	June 8, 1948	June 1, 1948	May 11, 1948	June 10, 1947
Heavy melt'g steel, P'gh.	$40.25	$40.25	$40.25	$32.75
Heavy mlt'g steel, Phila.	42.50	42.50	42.50	32.00
Heavy melt'g steel, Ch'go	39.25	39.25	39.25	31.25
No. 1, hy, comp. sh't, Det.	35.50	35.50	35.50	29.75
Low phos. Young'n	45.25	45.25	45.25	35.75
No. 1, cast, Pittsburgh	*63.75*	64.00	64.00	36.50
No. 1, cast, Philadelphia	67.00	67.00	65.50	43.50
No. 1, cast, Chicago	*69.50*	71.50	73.50	41.50
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$12.75	$12.50	$12.50	$10.50
Foundry coke, prompt	16.50	14.00	14.00	11.25
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro. Conn.	21.50	21.50	21.50	21.50
Copper, Lake Conn.	21.625	21.625	21.625	21.625
Tin, Grade A, New York	$1.03	$1.03*	94.00	80.00
Zinc, East St. Louis	12.00	12.00	12.00	10.50
Lead, St. Louis	17.30	17.30	17.30	14.80
Aluminum, virgin	15.00	15.00	15.00	15.00
Nickel, electrolytic	36.56	36.56	36.56	37.67
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	35.00	35.00	33.00	33.00

*Revised

Composite Prices . . .

Starting with the issue of Apr. 22, 1943, the weighted finished steel index was revised for the years 1941, 1942, and 1943. See explanation of the change on p. 90 of the Apr. 22, 1943, issue. Index revised to a quarterly basis as of Nov. 16, 1944; for details see p. 98 of that issue. The finished steel composite price for the current quarter is an estimate based on finished steel shipments for the previous quarter. This figure will be revised when shipments for this quarter are compiled

	FINISHED STEEL (Base Price)	PIG IRON	SCRAP STEEL
June 8, 1948	3.24473¢ per lb.	$40.53 per gross ton	$40.66 per gross ton
One week ago	3.24473¢ per lb.	$40.53 per gross ton	$40.66 per gross ton
One month ago	3.24473¢ per lb.	$40.20 per gross ton	$40.66 per gross ton
One year ago	2.85664¢ per lb.	$33.15 per gross ton	$32.00 per gross ton

	FINISHED STEEL HIGH	FINISHED STEEL LOW	PIG IRON HIGH	PIG IRON LOW	SCRAP STEEL HIGH	SCRAP STEEL LOW
1948	3.27585¢ Feb. 17	3.22566¢ Jan. 1	$40.53 May 18	$39.58 Jan. 6	$41.83 Jan. 29	$39.75 Mar. 9
1947	3.19541¢ Oct. 7	2.87118¢ Jan. 7	37.98 Dec. 30	30.14 Jan. 7	42.58 Oct. 28	29.50 May 20
1946	2.83599¢ Dec. 31	2.54490¢ Jan. 1	30.14 Dec. 10	25.37 Jan. 1	31.17 Dec. 24	19.17 Jan. 1
1945	2.44104¢ Oct. 2	2.38444¢ Jan. 2	25.37 Oct. 23	23.61 Jan. 2	19.17 Jan. 2	18.92 May 22
1944	2.30837¢ Sept. 5	2.21189¢ Oct. 5	$23.61	$23.61	19.17 Jan. 11	15.76 Oct. 24
1943	2.29176¢	2.29176¢	23.61	23.61	$19.17	$19.17
1942	2.28249¢	2.28249¢	23.61	23.61	19.17	19.17
1941	2.43078¢	2.43078¢	$23.61 Mar. 20	$23.45 Jan. 2	$22.00 Jan. 7	$19.17 Apr. 10
1940	2.30467¢ Jan. 2	2.24107¢ Apr. 16	23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9
1939	2.35367¢ Jan. 3	2.26689¢ May 16	22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 May 16
1938	2.58414¢ Jan. 4	2.27207¢ Oct. 18	23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June 7
1937	2.58414¢ Mar. 9	2.32263¢ Jan. 4	23.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9
1936	2.32263¢ Dec. 28	2.05200¢ Mar. 10	19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8
1935	2.07642¢ Oct. 1	2.06492¢ Jan. 8	18.84 Nov. 5	17.83 May 14	13.42 Dec. 10	10.33 Apr. 29
1934	2.15367¢ Apr. 24	1.95757¢ Jan. 2	17.90 May 1	16.90 Jan. 27	13.00 Mar. 13	9.50 Sept. 25
1933	1.95578¢ Oct. 3	1.75836¢ May 2	16.90 Dec. 5	13.56 Jan. 3	12.25 Aug. 8	6.75 Jan. 3
1932	1.89196¢ July 5	1.83901¢ Mar. 1	14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5
1931	1.99626¢ Jan. 13	1.86586¢ Dec. 29	15.90 Jan. 6	14.79 Dec. 15	11.33 Jan. 6	8.50 Dec. 29
1930	2.25488¢ Jan. 7	1.97319¢ Dec. 9	18.21 Jan. 7	15.90 Dec. 16	15.00 Feb. 18	11.25 Dec. 9
1929	2.31773¢ May 28	2.26498¢ Oct. 29	18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 8

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipments. Index recapitulated in Aug. 28, 1941, issue

Based on averages for basic iron at valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

Iron and Steel Prices . . .

Steel prices shown here are f.o.b. basing points in cents per pound unless otherwise indicated. Extras apply. Delivered prices are minimum and do not reflect 3 pct tax on freight. Industry practice has discontinued arbitrary f.o.b. prices at Gulf and Pacific Ports. Space limitations prevent quotation of delivered prices at major ports. (1) Commercial quality sheet grade; primes, 0.25¢ above base. (2) Commercial quality grade. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Cokes, 1.25 lb, deduct 20¢ per base box. (6) 18 gage and heavier. (7) For straight length material only from producers to fabricators. (8) Also shafting. For quantities of 40,000 lb & over. (9) Carload lot in manufacturing trade. (10) Arbitrary delivered prices. (11) Hollowware enameling, gages 29 to 31 only. (12) Produced to dimensional tolerances in AISI Manual Sec. 6. (13) Delivered San Francisco only. (14) Kaiser Co. prices (15) from 0.035 to 0.075 in. thick by ¾ to 8½ in. wide. (16) Deliverd Los Angeles; add 0.55¢ per 100 lb for San Francisco. (17) Slab prices subject to negotiation in most cases. (18) 24 to 14 gage, up to 48 in.; 26 gage, up to 22 in.; 30 to 27 gage, up to 36 in.

PRODUCTS	Prices at basing points apply only to the sizes and grades produced at those points.												DELIVERED TO		
	Pittsburgh	Chicago	Gary	Cleveland	Birmingham	Buffalo	Youngstown	Sparrows Point	Granite City	Middletown, Ohio		San Francisco, Los Angeles	Detroit[10]	New York	Philadelphia
INGOTS Carbon forging	$46.00	Rerolling ingots—$36.00 per net ton f.o.b. mill (Spot market as $75 to $90 per gross ton)													
Alloy	$56.00										Canton = $56.00				
BILLETS, BLOOMS, SLABS Carbon, rerolling[17]	$45.00	$45.00	$45.00	$47.00	$45.00	$45.00		$45.00							
Carbon forging billets	$54.00	$54.00	$54.00	$54.00	$54.00	$54.00	(per net ton)								
Alloy	$66.00	$66.00				(Bethlehem, Massillon, Canton = $66.00)									
PIPE SKELP	2.85 to 2.90						2.90								
WIRE RODS	2.80 to 3.55	2.80 to 3.80		2.80 to 3.05	2.85						Worcester = 2.90	3.5245[13]			
SHEETS Hot-rolled[6]	2.75 to 2.80	2.75 to 2.80	2.75	2.8..	2.75 to 2.80	2.80	2.75 to 2.80	2.80		Ashland, Ky. = 2.80		3.494[16] to 3.6875	2.96 to 3.01	3.18 to 3.31	3.06 to 3.24
Cold-rolled[1]	3.45 to 3.50	3.45 to 3.55	3.45	3.50		3.55	3.55	3.55[18]	3.65	3.50			3.66	3.91 to 4.01	3.81 to 3.94
Galvanized (10 gage)	3.85	3.95	3.85 to 3.95		3.85 to 3.95		3.95	3.95	4.05	3.95	Ashland = 3.95	4.624[16]		4.33	4.21
Enameling (12 gage)	3.85	3.75	3.75 to 3.85	3.95			3.95		4.05	3.85			4.11 to 4.16	4.41	4.34
Long ternes[2] (10 gage)	4.05		4.05											4.61	4.54
STRIP Hot-rolled[3]	2.80	2.75 to 2.80	2.75	2.75 to 2.80	2.75		2.75 to 2.80					3.554[16] to 3.9125	2.96 to 3.01	3.38	3.29
Cold-rolled[4]	3.50	3.55 to 3.65	3.55	3.45 to 3.50			3.55			Worcester = 3.65) to 3.75			3.66	4.05	3.99
TINPLATE Cokes, 1.50 lb,[5] base box	6.70	6.70	6.70		6.80			6.80	6.90	(Warren, Ohio = $6.80)				7.18	7.06
Electrolytic 0.25, 0.50, 0.75 lb, box	Deduct $1.00, 80¢ and 60¢ respectively from 1.50 lb coke base box price.														
TERNES, MFG., special coated	Deduct 90¢ from 1.50 lb coke base box price.														
BLACKPLATE, CANMAKING 55-70 lb, 75-95 lb, 100-128 lb	Deduct $1.60, $1.70 and $1.60 respectively from 1.50 lb coke base box price.														
BLACKPLATE, h.e., 29 ga.[11]	4.65	4.65	4.65					4.75	4.85					5.13	5.01
BARS Carbon Steel	2.85 to 2.90	2.85 to 2.90	2.85	2.90	2.85 to 2.90	2.90	2.85 to 2.90					3.579[16] to 3.629[16]	3.06 to 3.11	3.40	3.34
Reinforcing (billet)[7]	2.70 to 2.80	2.70 to 2.80	2.70		2.70		2.70	2.75				3.325[16]		3.13	3.01
Cold-finished[1]	3.45 to 3.55	3.45 to 3.55		3.45									3.60 to 3.76	4.01	3.94
Alloy, hot-rolled	3.20	3.20 to 3.30	3.20			3.30	3.20	Bethlehem, Massillon, Canton = 3.30						3.86	3.48
Alloy, cold-drawn	4.00 to 4.10	4.00 to 4.10		4.00		4.10		Massillon, Canton = 4.10						4.58	4.49
PLATE Carbon steel[12]	2.90 to 2.95	2.90 to 2.95	2.90 to 2.95	2.95	2.85 to 2.90		2.90 to 2.95	Coatesville = 3.45, Claymont = 3.65 2.95 Geneva, Utah = 2.90				3.8375[14]		3.33	3.21
Floor plates	4.05	3.95 to 4.05	3.95	4.05										4.81	4.54
Alloy	3.70	3.70	3.70						Coatesville = 4.80					4.23	4.19
SHAPES, Structural	2.75	2.75 to 2.80	2.75 to 2.80		2.75		Bethlehem = 2.80, Geneva, Utah = 2.75					3.424[16] to 3.49		3.06	2.98
MANUFACTURERS' WIRE[9] Bright	3.45 to 3.80	3.45 to 4.05		3.45	3.45 to 3.55					Worcester = 3.55 Duluth = 3.50		4.4645[13]		3.95	3.94
Spring (high carbon)	4.50	4.50		4.50					Worcester = 4.60 Trenton, Duluth = 4.75			5.5345[13]		5.00	4.99
PILING, Steel sheet	3.30	3.30				3.30								3.93	3.79

CORROSION AND HEAT RESISTANT STEELS

In cents per pound, f.o.b. basing point

Basing Point	Chromium Nickel		Straight Chromium			
	No. 304	No. 302	No. 410	No. 430	No. 442	No. 446
Billets, forging, P'gh, Chi, Canton, Dunkirk, Balt, Phila, Reading, Water, Syracuse, Ft. Wayne, Titusville, Beth, Brackenridge	23.00	22.50	17.50	17.50	21.00	25.50
Bars, h-r, P'gh, Chi, Canton, Dunkirk, Watervliet, Syracuse, Balt, Phila, Reading, Ft. Wayne, Titusville, Beth, Brackenridge	27.50	26.00	20.50	21.00	24.50	30.00
Bars, c-f, P'gh, Chi, Cleve, Canton, Dunkirk, Syracuse, Balt, Phila, Reading, Ft. Wayne, Watervliet, Beth, Brackenridge	27.50	26.00	20.50	21.00	24.50	30.00
Plates, P'gh, Middletown, Canton, Brackenridge, Balt, Coatesville	31.50	29.50	23.50	24.00	28.00	33.00
Shapes, structural, P'gh, Chi, Brackenridge	27.50	26.00	20.50	21.00	24.50	30.00
Sheets, P'gh, Chi, Middletown, Canton, Balt, Brackenridge	39.00	37.00	29.00	31.50	35.50	39.50
Strip, h-r, P'gh, Chi, Reading, Canton, Youngstown	25.50	23.50	18.50	19.00	26.00	38.00
Strip, c-r, P'gh, Cleve, Jersey City, Reading, Canton, Youngstown, Balt, W. Leechburg	32.50	30.50	24.00	24.50	35.00	56.50
Wire, c-d, Cleve, Dunkirk, Syracuse, Balt, Reading, Canton, P'gh, Newark, N. J., Phila, Ft. Wayne, Brackenridge	27.50	26.00	20.50	21.00	24.50	30.00
Wire, flat, c-r, Cleve, Balt, Reading, Dunkirk, Canton, W. Leechburg	32.46	30.30	23.80	24.34	34.82	56.26
Rod, h-r, Syracuse	27.05	25.97	20.02	20.56	24.34	28.75
Tubing, seamless, P'gh, Chi, Canton, Brackenridge, Milwaukee	72.09	72.09	.....	68.49	.....	.....

ELECTRODES

Cents per lb, f.o.b. plant, threaded electrodes with nipples, unboxed

Diameter in in.	Length in in.	
Graphite		
17, 18, 20	60, 72	14.00¢
8 to 16	48, 60, 72	14.50¢
7	48, 60	15.75¢
6	48, 60	17.00¢
4, 5	40	17.50¢
3	40	18.50¢
2½	24, 30	19.00¢
2	24, 30	21.00¢
Carbon		
40	100, 110	6.75¢
35	65, 110	6.75¢
30	65, 84, 110	6.75¢
24	72 to 104	6.75¢
17 to 20	84, 90	6.75¢
14	60, 72	7.25¢
10, 12	60	7.50¢
8	60	7.75¢

TOOL STEEL

*(F.o.b. Pittsburgh, Bethlehem, Syracuse, Dunkirk. *Also Canton, Ohio)*

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	82¢
18	4	1	—	5	$1.29
18	4	2	—	—	93¢
1.5	4	1.5	8	—	59¢
6	4	2	6	—	63¢

High-carbon-chromium*	47¢
Oil hardening manganese*	26¢
Special carbon*	24¢
Extra carbon*	20¢
Regular carbon*	17¢

Warehouse prices on and east of Mississippi are 2¢ per lb higher; west of Mississippi, 4¢ higher.

ELECTRICAL SHEETS

Base, all grades f.o.b. Pittsburgh

	Per lb
Armature	4.70¢ to 5.05¢
Electrical	5.20¢ to 5.45¢
Motor	5.95¢ to 6.30¢
Dynamo	6.65¢ to 7.50¢
Transformer 72	7.15¢ to 8.25¢
Transformer 65	7.85¢ to 9.20¢
Transformer 58	8.55¢ to 9.90¢
Transformer 52	9.35¢ to 9.70¢

F.o.b. Chicago and Gary: armature through motor only. F.o.b. Granite City add to lower quotation 0.55¢ for armature through and including 72, and 0.45¢ for balance.

RAILS, TRACK SUPPLIES

(F.o.b. mill)

Standard rails, 100 lb and heavier, No. 1 O.H., per 100 lb	$2.70 to $2.75*
Joint bars, 100 lb	3.75
Light rails (from billets) per 100 lb.	3.05

* CF&I charges $3.05.

	Base per lb
Cut spikes	4.85¢
Screw spikes	6.90¢
Tie plate, steel	3.55¢
Tie plates, Pittsburg, Calif.	3.70¢
Track bolts	7.00¢
Track bolts, heat treated, to railroads	7.25¢

C-R SPRING STEEL

Base per pound f.o.b. Pittsburgh, Cleveland

0.08 to 0.40 carbon	3.45¢
0.41 to 0.60 carbon	4.95¢
0.61 to 0.80 carbon	5.55¢
0.81 to 1.05 carbon	7.05¢
1.06 to 1.35 carbon	9.35¢
Worcester, add 0.20¢	

CLAD STEEL

Base prices, cents per pound

Stainless-clad	Plate	Sheet
No. 304, 20 pct, f.o.b. Pittsburgh, Washington, Coatesville, Pa.	*24.00	*22.00
Nickel-clad		
10 pct, f.o.b. Coatesville, Pa.	21.50	...
Inconel-clad		
10 pct, f.o.b. Coatesville	30.00	...
Monel-clad		
10 pct, f.o.b. Coatesville	24.00	...
Aluminized steel		
Hot dip, 20 gage, f.o.b. Pittsburgh	....	9.00

* Includes annealing and pickling, or sandblasting.

MERCHANT WIRE PRODUCTS

To the dealer, f.o.b. Pittsburgh, Chicago, Birmingham

	Base Column	San Francisco
Standard & coated nails*	91	112
Galvanized nails*	91	112
Woven wire fence†	97	120
Fence posts, carloads††	104	...
Single loop bale ties	94	118
Galvanized barbed wire**	111	131
Twisted barbless wire	111	...

* Also Duluth; Worcester, 6 columns higher. † 15½ gage and heavier. ** On 80-rod spools, in carloads. †† Duluth only.

	Base per 100 lb	San Francisco
Annealed fence wire‡	$4.10	$5.1145
Annealed, galv. fencing‡	4.55	5.5645
Cut nails, carloads‡‡	6.15	...

‡ Add 10¢ at Worcester. ‡‡ Wheeling only, Pittsburgh add 15¢ (less 20¢ to jobbers).

HIGH STRENGTH, LOW ALLOY STEELS

base prices, cents per pound

Steel	Alde-cor	Corten	Double Strength No. 1	Dyn-alloy	HI Steel	Mayari R	Otis-coloy	Yoloy	NAX High Tensile
Producer	Republic	Carnegie-Illinois, Republic	Republic	Alan Wood	Inland	Bethlehem	Jones & Laughlin	Youngstown Sheet & Tube	Great Lakes Steel
Plates	4.55	4.45	4.55	4.55	4.45	4.55	4.45	4.55	4.55
Sheets									
Hot-rolled	4.30	4.20	4.30	4.50	4.20	4.30	4.20	4.30	4.30
Cold-rolled	5.30	5.20	5.30	...	5.20	5.30	5.20	5.30	5.30
Galvanized		5.90	....	....	5.90	6.00	....	....	....
Strip									
Hot-rolled	4.30	4.20	4.30	...	4.20	4.30	4.20	4.30	4.30
Cold-rolled	....		5.30	....		5.30	5.30	5.30	5.30†
Shapes	....	4.20		....	4.20	4.30	4.20	4.30	...
Beams	....	4.20	....	....	4.20	4.30	....	....	....
Bars									
Hot-rolled	4.45	4.35	4.45	....	4.35	4.45	4.35	4.45	4.45
Bar shapes	....	4.35	....	....	4.35	4.45	4.35	4.45	....

† Pittsburgh, add 0.10¢ at Chicago and Gary.

PIPE AND TUBING

Base discounts, f.o.b. Pittsburgh and Lorain, steel buttweld and seamless. Others f.o.b. Pittsburgh only
Base price, $200.00 per net ton

One producer allows 1 point less discount on steel buttweld.

Standard, threaded & coupled

Steel, buttweld	Black	Galv.
⅛-in.	48	30½
¼-in.	51	34½
⅜-in.	53½	37½
½-in.	54	38
¾-in.	54½	38½
1-in.	55	39
1¼ and 1½-in.	55½	39½
Wrought Iron, buttweld		
⅛-in.	+11	+35
¼-in.	+ 1½	+25
⅜ and 1¼-in.	4	+16½
1½-in.	9½	+13
2-in.	10	+12½
Steel, lapweld		
⅛-in.	44½	28
¼ and ⅜-in.	48½	32
½ to 6-in.	50½	34
Steel, seamless		
⅛-in.	43½	27
¼ and ⅜-in.	46½	30
½ to 6-in.	48½	32
Wrought Iron, lapweld		
⅛-in.	1½	+20
¼ to 3½-in.	4	+16
4-in.	8	+10½
4½ to 8-in.	6	+12

Extra Strong, plain ends

Steel, buttweld		
⅛-in.	46	30
¼-in.	50	34
⅜-in.	52	37
1¼-in.	52½	37½
1½-in.	53	38
2-in.	53½	38½
2½ and 3-in.	54	39
Wrought Iron, buttweld		
⅛-in.	+ 6½	+29
¼-in.	+ ½	+23
⅜ and 1¼-in.	4	+16½
2-in.	10	+12½
Steel, lapweld		
2-in.	43½	28
2½ and 3-in.	48½	33
3½ to 6-in.	52	36½
Steel, seamless		
2-in.	42½	27
2½ and 3-in.	46½	31
3½ and 6-in.	50	34½
Wrought Iron, lapweld		
2-in.	4½	+16½
2½ to 4-in.	13	+ 6
4½ to 6-in.	9	+10½

Basing discounts for standard pipe are for threads and couplings. For threads only, buttweld, lapweld and seamless pipe, one point higher discount (lower price) applies. For plain ends, buttweld, lapweld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lapweld and seamless 3½-in. and larger four points higher discount (lower price) applies. F.o.b. Gary prices are one point lower discount on all buttweld. On buttweld and lapweld steel pipe, jobbers are granted a discount of 5 pct. On l.c.l. shipments, prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Net base prices per 100 ft, f.o.b. Pittsburgh in carload lots, cut length 4 to 24 ft, inclusive.

OD in.	Gage BWG	Seamless Hot-Rolled	Seamless Cold-Drawn	Electric Weld Hot-Rolled	Electric Weld Cold-Drawn
2	13	$17.84	$20.99	$17.30	$20.36
2½	12	23.99	28.21	23.27	27.36
3	12	26.68	31.40	25.88	30.46
3½	11	33.35	39.26	32.35	38.08
4	10	41.40	48.70	40.16	47.24

CAST IRON WATER PIPE

Per net ton

4-in to 24-in., del'd Chicago	$98.70
4-in. to 24-in., del'd New York	95.50
4-in. to 24-in., Birmingham	85.50
4-in and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less	112.30

Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts f.o.b Pittsburgh, Cleveland, Birmingham or Chicago)

Base discount less case lots

Machine and Carriage Bolts

	Percent Off List
½ in. & smaller x 6 in. & shorter	45
9/16 & ⅝ in. x 6 in. & shorter	46
¾ in. & larger x 6 in. & shorter	43
All diam, longer than 6 in.	41
Lag, all diam over 6 in. long	44
Lag, all diam x 6 in. & shorter	46
Plow bolts	54

Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)

½ in. and smaller	43
9/16 to 1 in. inclusive	42
1⅛ to 1½ in. inclusive	40
1⅝ in. and larger	35

On above bolts and nuts, excepting plow bolts, additional allowance of 15 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.

Semifin. Hexagon Nuts	USS	SAE
7/16 in. and smaller	..	46
½ in. and smaller	44	..
½ in. through 1 in.	..	44
9/16 in. through 1 in.	43	..
1⅛ in. through 1½ in.	41	42
1⅝ in. and larger	35	..

In full case lots, 15 pct additional discount. For 200 lb or more, freight allowed up to 50¢ per 100 lb, based on Cleveland, Chicago, Pittsburgh.

Stove Bolts

Packages, nuts separate	65 and 10
In bulk	75

On stove bolts freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago, New York on lots of 200 lb or over.

Large Rivets

(½ in. and larger)

	Base per 100 lb
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	$5.65
F.o.b. Lebanon, Pa.	5.80

Small Rivets

(7/16 in. and smaller)

	Percent Off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	55

Cap and Set Screws

(In packages)	Percent Off List
Hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in., SAE 1020, bright	53
¾ to 1 in. x 6 in., SAE 1035, heat treated	44
Set screws, oval points	57
Milled studs	29
Flat head cap screws, listed sizes	16
Fillister head cap, listed sizes	37

Freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago or New York on lots of 200 lb or over.

FLUORSPAR

Metallurgical grade, f.o.b. producing plant.

Effective CaF_2 Content:	Base price per short ton
70% or more	$35.00
65% but less than 70%	34.00
60% but less than 65%	33.00
Less than 60%	32.00

LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports)

	Per Gross Ton
Old range, bessemer	$6.60
Old range, nonbessemer	6.45
Mesabi, bessemer	6.35
Mesabi, nonbessemer	6.20
High phosphorus	6.20

Increases or decreases in freight rates, dock handling charges and taxes after Apr. 1, 1948, are to be added to above prices.

METAL POWDER

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.l.f. New York, ocean bags	7.9¢ to 9.0¢
Domestic sponge iron, 98+% Fe	9.5¢ to 16.0¢
Electrolytic iron, annealed, 99.5+% Fe	19.5¢ to 39.5¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe.	44.0¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe	63.0¢ to 80.0¢
Carbonyl iron, minus 300 mesh, 98%, 99.8+% Fe	90.0¢ to $1.75
Aluminum	23.0¢
Antimony	46.0¢
Brass	24.0¢ to 28.5¢
Copper, electrolytic	30.625¢
Copper, reduced	30.5¢
Cadmium	$2.40
Chromium, electrolytic, 99% min.	$3.50
Lead	24.0¢
Manganese	50.0¢
Molybdenum, 99%	$2.65
Nickel, unannealed	51.5¢
Nickel, spherical, minus 30 mesh	53.0¢
Silicon	29.0¢
Solder powder	8.5¢ plus metal cost
Stainless steel, 302	75.0¢
Tin	$1.11
Tungsten, 98%, 99%	$2.90

COKE

Furnace, beehive (f.o.b. oven) Net Ton Connellsville, Pa.	$12.00 to $13.00
Foundry, beehive (f.o.b. oven) Connellsville, Pa.	13.50 to 14.50
Foundry, Byproduct	
Chicago, del'd	$18.60
Chicago, f.o.b.	17.50
Detroit, f.o.b.	18.50
New England, del'd	21.75
Seaboard, N. J., f.o.b.	20.50
Philadelphia, f.o.b.	19.50
Swedeland, Pa., f.o.b.	19.50
Ashland, Ohio, f.o.b.	18.25
Painesville, Ohio, f.o.b.	19.45
Erie, del'd	19.95
Cleveland, del'd	17.90
Cincinnati, del'd	18.59
St. Louis, del'd	18.03
Birminham, del'd	16.71

REFRACTORIES

(F.o.b. Works)

Fire Clay Brick	Carloads, Per 1000
No. 1 Ohio	$67.00
First quality, Pa., Md., Ky., Mo., Ohio	73.00
First quality, New Jersey	78.00
Sec. quality, Pa., Md., Ky., Mo., Ohio	67.00
Sec. quality, New Jersey	70.00
No. 2 Ohio	59.00
Ground fire clay, net ton, bulk	10.50

Silica Brick

Pennsylvania and Birmingham	$73.00
Chicago District and Alabama	82.00
Silica cement, net ton (Eastern)	12.50
East Chicago	13.50

Chrome Brick	Per Net Ton
Standard chemically bonded, Balt., Plymouth Meeting, Chester	$64.00

Magnesite Brick

Standard, Balt. and Chester	$86.00
Chemically bonded, Baltimore	75.00

Grain Magnesite

std. ⅜-in. grains

Domestic, f.o.b. Balt. and Chester in bulk, fines removed	$51.50
Domestic, f.o.b. Chewelah, Wash., in bulk with fines	27.00
in sacks with fines	31.50

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk. Midwest, add 10¢; Missouri Valley, add 20¢ $11.05

WAREHOUSE PRICES

Base prices, delivered metropolitan areas, per 100 lb.

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled A 4140-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
Philadelphia	$4.47	$5.66	$5.92	$4.82	$5.90	$4.82	$4.54	$4.86	$5.73	8.50	$7.15	$10.18	$10.38
New York	4.84	6.01[1]	6.16	5.08	6.36	5.11	4.80	5.06	5.78	8.58	8.73	10.22	10.43
Boston	4.83	5.89	6.23[12]	5.61	6.87	5.18	4.91	5.04	5.88	8.99	9.14	10.43	10.58
Baltimore	4.27	....	5.62	4.79	....	4.72	4.69	4.64	5.86	....	..	....	...
Norfolk	4.90	....	....	5.30	....	5.15	5.15	5.20	5.90	....	..	....	...
Chicago	4.20	5.00	5.88	4.35	5.35-6.65	4.55	4.35	4.35	5.20-5.41	8.05	8.20	9.30	9.50
Milwaukee	4.57	5.37	5.95	4.72	5.83	4.92	4.72	4.72	5.48-5.58	8.53	8.68	9.78	9.98
Cleveland	4.25	5.10[1]	5.82	5.05	5.95	4.60†	4.70	4.40	5.10	8.61	8.78	9.50	9.85
Buffalo	4.25	5.10	6.06	5.26	5.97	5.01	4.80	4.40‡	5.10	8.20	8.35	9.50	9.65
Detroit	4.41	5.26	6.07	4.77	5.67	4.92†	4.82	4.56-4.82	5.26	8.82	8.97	10.09	10.24
Cincinnati	4.56	5.22	5.57	4.77	....	4.98	4.82	4.78	5.63	8.85	9.00	10.16	10.31
St. Louis	4.59	5.39	6.17	4.69	6.02	4.89	4.74	4.76	5.67	8.92	9.07	10.22	10.37
Pittsburgh	4.25	5.10[1]	5.65	4.35	....	4.60	4.40	4.40	5.10	8.20	8.35	9.50	9.65
St. Paul	4.68	5.46	6.0	4.78	....	5.01	4.81	4.81	5.94	....	....	....	....
Omaha	5.262	....	6.712	5.362	....	5.612	5.412	5.412	6.112	....	....	....	....
Indianapolis	4.55	5.38	5.93	4.65	5.95	4.90	4.70	4.70	5.57	....	....	....	....
Birmingham	4.45[11]	....	5.80	4.45[11]	....	4.65[11]	4.40[11]	4.40[11]	6.09	....	....	....	....
Memphis	4.88[11]	5.94[1]	5.08[11]	....	5.23[11]	5.03[11]	5.03[11]	5.94	....	....	....	....	....
New Orleans	*5.05[11]	6.39[1]	....	5.25[11]	....	5.40[11]	*5.10[11]	*5.20[11]	6.39[6]	....	....	....	....
Houston	5.55	....	7.21	5.65	....	5.90	5.70	5.70	7.00	9.40	9.25	10.40	10.55
Los Angeles	5.70	7.26[1]	7.30	6.00	8.60[5]	5.35	5.15	5.45	7.25[14]	9.55[15]	9.40[15]	10.95[15]	11.15[15]
San Francisco	5.35[8]	6.55	6.95	5.70[8]	8.60	5.30	5.10	5.00	7.40	9.55[15]	9.45[15]	11.05[15]	11.20[15]
Seattle	5.45[4]	7.25[2]	7.10	6.15[4]	....	5.70	5.40[4]	5.65[4]	7.45[14]	....	9.70[15]	....	11.30[15]
Portland	5.70	7.25[2]	7.10	5.85[4]	....	5.70[4]	5.40[4]	5.65[4]	7.45[14]	....	8.95[16]	....	11.30[15]
Salt Lake City	6.40	....	7.85	6.70	....	6.20	6.35	6.55	7.55	....	....	....	....

BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED: Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-ROLLED: Sheets, 400 to 1999 lb; strip, extras on all quantities; bars 1000 lb and over.

ALLOY BARS: 1000 to 1999 lb.

GALVANIZED SHEETS: 450 to 1499 lb.

EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 800 to 4999 lb; (4) 800 to 9999 lb; (5) 2000 lb and over; (6) 1000 lb and over; (7) 400 to 14,999 lb; (8) 400 lb and over; (9) 500 to 1999 lb; (10) 500 to 999 lb (11) 400 to 3999 lb; (12) 450 to 8749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 4999 lb; (16) 4000 lb and over; (17) a to 1999 lb.

* Add 46¢ for sizes not rolled in Birmingham

† Up to ¾ in. thick and 90 in. wide

‡ Add 41¢ for sizes not rolled at Buffalo.

PIG IRON PRICES

Dollars per gross ton. Delivered prices represent minimums. Delivered prices do not include 3 pct tax on freight.

BASING POINT* PRICES

Basing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	40.00	40.50	41.00	41.50	.....
Birmingham	38.88	39.38	.....	.....	.....
Buffalo	40.00-42.38*	40.00-42.88*	40.50 43.38*	.....	.....
Chicago	38.50	39.00	39.50	40.00	.....
Cleveland	38.50-39.75*	39.00-40.25*	39.50-40.75*	.....	.....
Duluth	39.00	39.50	40.00	40.50	.....
Erie	38.50	39.00	39.50	40.00	.....
Everett		45.00	45.50	.....	.....
Granite City	45.25	45.75	46.25	.....	.....
Neville Island	42.00	42.50	42.50	43.00	.....
Provo	39.00	39.50	.....	.....	.....
Sharpsville	39.00	39.50	39.50	40.00	.....
Steelton	40.00	.....	.....	.....	46.00
Struthers, Ohio	42.50	.....	.....	.....	.....
Swedeland	45.00	45.50	46.00	46.50	.....
Toledo	38.50	39.00	39.50	40.00	.....
Troy, N. Y.	...	...	...	.....	46.00
Youngstown	39.00	39.50	39.50	40.00	.....

DELIVERED PRICES† (BASE GRADES)

Consuming Point	Basing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Boston	Everett	$0.50 Arb.	.....	45.50	46.00	.....	.....
Boston	Steelton	6.27	46.27	.....	.....	.....	52.27
Brooklyn	Bethlehem	3.90	43.90	44.40	44.90	45.40	.....
Cincinnati	Birmingham	6.09	44.97	45.47	.....	.....	.....
Jersey City	Bethlehem	2.39	42.39	42.89	43.39	43.89	.....
Los Angeles	Provo	6.93	45.93	44.43	.....	.....	.....
Mansfield	Cleveland-Toledo	3.03	41.53-42.78*	42.03-43.28*	42.53 43.78*	.....	.....
Philadelphia	Bethlehem	2.17	42.17	42.67	43.17	43.67	.....
Philadelphia	Swedeland	1.31	46.31	46.81	47.31	47.61	.....
Philadelphia	Steelton	2.81	42.81	.....	.....	.....	48.81
San Francisco	Provo	6.93	45.93	46.43	.....	.....	.....
Seattle	Provo	6.93	45.93	46.43	.....	.....	.....
St. Louis	Granite City	0.75 Arb.	46.00	46.50	47.00	.....	.....

* Republic Steel Corp. price. Basis: pig iron at Cleveland and Buffalo set by average price of No. 1 hvy. mlt. steel scrap at Cleveland or Buffalo respectively as shown in last week's issue of THE IRON AGE. Price is effective until next Sunday midnight.

Basing point prices are subject to switching charges; silicon differential (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct); phosphorus differentials, a reduction of 38¢ per ton for phosphorus content of 1.70 pct and over; manganese differentials, a charge not to exceed 50¢ per ton for each 0.50 pct manganese content in excess of 1.00 pct. $2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and $1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.00 to 6.50 pct, C/L per g.t., f.o.b. Jackson, Ohio—$53.50; f.o.b. Buffalo—$50.75. Add $1.25 per ton for each additional 0.50 pct Si, up to 12 pct. Add 50¢ per ton for each 0.50 pct Mn over 1.00 pct. Add $1.00 per ton for 0.7 pct or more P. Bessemer ferrosilicon prices are $1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorus $58.00 per gross ton, f.o.b. Lyle, Tenn. Delivered Chicago, $65.55. High phosphorus charcoal pig iron is not being produced.

Ferromanganese

78-82% Mn, Maximum contract base price, gross ton, lump size, f.o.b. Baltimore, Philadelphia, New York, Birmingham, Rockwood, Tenn.

Carload lots (bulk) $145
Less ton lots (packed) 189.00
Delivered Pittsburgh 151.00

$1.80 for each 1% above 82% Mn; penalty, $1.80 for each 1% below 78%.

Briquets—Cents per pound of briquet, freight allowed, 66% contained Mn.

	Eastern	Central	Western
Carload, bulk ...	8.70	8.95	9.50
Ton lots	10.30	10.90	12.80
Less ton lots ...	11.20	11.80	13.70

Spiegeleisen

Contract prices, gross ton, lump, f.o.b. Palmerton, Pa.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Carloads	$51.00	$52.00
f.o.b. Pittsburg.h.	50.00	51.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, f.o.b. shipping point, freight allowed, eastern zone.

96% min. mn, 0.2% max. C, 1% max. Si, 2% max. Fe.

Carload, bulk	32
L.c.l. lots	34

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	32
Ton lots	34
Less ton lots	36

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, f.o.b. shipping point, freight allowed, eastern zone.

	Carloads	Ton	Less
.07% max. C. 0.06% P, 90% Mn.	23.00	24.85	26.05
.10% max. C.	22.50	24.35	25.55
.15% max. C.	22.00	23.85	25.05
.30% max. C.	21.50	23.35	24.55
.50% max. C.	21.00	22.85	24.05
.75% max. C., 7.00% max. Si.	18.00	19.85	21.05

Silicomanganese

Contract basis, lump size, cents per pound of metal, f.o.b. shipping point, freight allowed, 65-70% Mn, 17-20% Si, 1.5% max. C.

Carload bulk	7.80
Ton lots	9.45
Briquet, contract basis, carlots, bulk freight allowed, per lb of briquet	8.75
Ton lots	10.35
Less ton lots	11.25

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, openhearth $78.00, foundry, $79.00; 18.75 f.o.b. Niagara Falls; $77.50 f.o.b Jackson, Ohio. Electric furnace silvery iron is not being produced at Jackson. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 per ton for each 0.50 pct Mn over 1 pct.

Silicon Metal

Contract price, cents per pound contained Si, lump size, f.o.b. shipping point, freight allowed, for ton lots packed.

	Eastern	Central	Western
98% Si, 2% Fe..	16.90	17.50	18.10
97% Si, 1% Fe..	17.30	17.90	18.50

Silicon Briquets

Contract price, cents per pound of briquet, bulk, f.o.b. shipping point, freight allowed to destination, 40% Si, 1 lb Si briquets.

	Eastern	Central	Western
Carload, bulk ...	5.25	5.50	5.70
Ton lots	6.85	7.45	7.75
Less ton lots ...	7.75	8.35	8.65

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
90% Si	15.50	....	....
85% Si	9.30	9.80	10.00
75% Si	11.80	12.10	12.35
50% Si	13.80	13.60	14.35
25% Si	15.00	15.30	16.00

Ferrochrome (65-72% Cr, 2% max. Si)

Contract prices, cents per pound, contained Cr, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
0.06% C	26.50	26.90	27.00
0.10% C	26.00	26.40	26.50
0.15% C	25.50	25.90	26.00
0.20% C	25.25	25.65	25.75
0.50% C	25.00	25.40	25.50
1.00% C	24.50	24.90	24.75
2.00% C	24.25	24.65	24.75
65-69% Cr, 4-9% C	18.60	19.00	19.15
62-66% Cr, 4-6% C. 6-9% Si.	19.45	19.85	20.00

Briquets — Contract price, cents per pound of briquet, f.o.b. shipping point, freight allowed, 60% chromium.

	Eastern	Central	Western
Carload, bulk ...	12.50	12.75	12.85
Ton lots	14.00	14.90	15.50
Less ton lots....	14.90	15.80	16.40

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 2¢ per lb to regular low carbon ferrochrome price schedule. Add 2¢ for each additional 0.25% N.

S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, f.o.b. shipping point, freight allowed.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

	Eastern	Central	Western
Carload	19.70	20.10	20.25
Ton lots	21.85	23.15	23.95
Less ton lots ...	23.35	24.65	25.45

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% mn, 1.25% max. C.

	Eastern	Central	Western
Carload	25.00	25.40	25.50
Ton lots	27.30	27.95	29.15
Less ton lots ...	29.10	29.75	30.95

Chromium Metal

Contract prices, cents per lb, chromium contained carload packed, f.o.b. shipping point freight allowed, 97% min. Cr. 1% max. Fe.

	Eastern	Central	Western
0.20% max. C. ..	97.00	98.50	99.75
0.50% max. C. ..	93.00	94.50	95.75
9.00% min. C. ..	91.50	93.00	94.25

Calcium—Silicon

Contract price per lb of alloy, lump, f.o.b. shipping point, freight allowed.

30-35% Ca, 60-65% Si, 3.00% max. Fe or 28-32% Ca, 60-65% Si, 6.00% max. Fe.

	Eastern	Central	Western
Carloads	16.25	16.75	18.80
Ton lots	19.35	20.10	22.25
Less ton lots	20.85	21.60	23.75

Calcium—Manganese—Silicon

Contract prices, cents per lb of alloy, lump, f.o.b. shipping point, freight allowed.

16-20% Ca, 14-18% Mn, 53-59% Si.

	Eastern	Central	Western
Carloads	17.50	18.00	20.05
Ton lots	19.80	20.65	22.40
Less ton lots ...	20.80	21.65	23.40

Calcium Metal

Eastern zone contract prices, cents per pound of metal, f.o.b. shipping point, freight allowed. Add 1.5¢ for central zone; 3.5¢ for western zone.

	Cast Turnings	Distilled
Ton lots $1.85	$2.70	$3.40
Less ton lots 2.20	3.05	4.20

CMSZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-500% C.

	Eastern	Central	Western
Ton lots	18.00	19.10	21.05
Less ton lots ...	19.25	20.35	22.30

SMZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed. 60-65% Si, 5-7% Mn. 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

	Eastern	Central	Western
Ton lots	15.75	16.85	18.80
Less ton lots ...	17.00	18.10	20.05

Other Ferroalloys

Ferrotungsten, standard, lump or ¼ x down, packed, f.o.b. plant Niagara Falls, Washington, Pa., York, Pa., per pound contained W, 5 ton lots, freight allowed...	$2.35
Ferrovanadium, 35-55%, contract basis, f.o.b. plant, freight allowances, per pound contained V.	
Openhearth	$2.90
Crucible	3.00
High speed steel (Primos) ...	3.10
Vanadium pentoxide, 88-92% V_2O_5 contract basis, per pound contained V_2O_5	$1.20
Ferrocolumbium, 50-60%, contract basis, f.o.b. plant, freight allowed, per pound contained Cb	
Ton lots	$2.50
Less ton lots	$2.55
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo.	95¢
Calcium molybdate, 40-45%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo.	80¢
Molybdenum oxide briquets, 48-52% Mo, f.o.b. Langeloth, Pa., per pound contained Mo.....	80¢
Molybdenum oxide in cans, f.o.b. Langeloth and Washington, Pa., per pound contained Mo.....	80¢
Ferrotitanium, 40-45%, 0.10% C max., f.o.b. Niagara Falls, N. Y., ton lots, per pound contained Ti	$1.23
Ferrotitanium, 20-25%, 0.10% C max., ton lots, per pound contained Ti	$1.35
Less ton lots	$1.40
High carbon ferrotitanium, 15-20%, 6-8% C, contract basis, f.o.b. Niagara Falls, freight allowed, carloads, per net ton....	$152.50
Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton	$65.00
Less ton lots	$1.25
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Carload lots	18.40¢
Zirconium, 12-15%, contract basis, lump, f.o.b. plant, freight allowed, per pound of alloy	
Carload, bulk	6.00¢
Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	
Carload	7.20¢
Ton lots	7.70¢
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Car lots	9.50¢
Ton lots	10.25¢

Boron Agents

Contract prices per pound of alloy, f.o.b. shipping point, freight allowed

Ferroboron, 17.50% min. B, 1.50% max Si, 0.50% max. Al, 0.50% max. C.

	Eastern	Central	Western
	$1.20	$1.23	$1.21

Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C.

Ton lots	$1.89	$1.903	$1.935
Less ton lots	2.01	2.023	2.044

Nickel—Boron 15-18% B, 1.00% max. Al 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni.

Less ton lots..	$1.80	$1.8125	$1.8445

Silcaz, contract basis, f.o.b. plant freight allowed, per pound.

Carload lots	39.00¢

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 50 lb and over.

No. 1	93¢
No. 6	63¢
No. 79	45¢

Bortram, f.o.b. Niagara Falls

Ton lots, per pound	45¢
Less ton lots, per pound	50¢

Carbortam, f.o.b., Suspension Bridge, N. Y., freight allowed, Ti 15-17%, B 0.90-1.15%, Si 2.5-3.0%, Al 1.0-2.0%.

Ton lots, per pound	8.0¢

Borosil, f.o.b. Philo, Ohio, freight allowed, B 3%-4%, Si 40%-45%, per lb contained B $6.25

Germany's Steel Output Shows 25 Pct Increase

London

• • • **An increase** in the production rate of steel of 25 pct since December is reported by the Bipartite Control Office in Germany. Approximately 363,000 ingot tons were produced in April, exceeding the previous high set up in March by 20,000 tons. This is attributed by Bizone officials to more regular deliveries of fuel in line with allocations, and the availability of richer imported ores which became effective during April.

The authorities welcome the recent recruitment of 500 women workers for their plant at Oberhausen by the Huettenwerke firm as giving a lead in the production drive to other German steelmakers.

Female workers at Oberhausen are being employed in such tasks as crane driving and unloading lighter products and auxiliary materials. The need for tapping fresh sources of labor is likely to become progressively more pronounced as the permitted level of steel production is approached.

The Bizonal authorities cite the recent output figures as an indication that the increased steel prices coupled with the campaign by the German authorities to familiarize workers in every steel plant with the industry's overall program and with each plant's share in the new goal are already achieving results.

Thomas J. Hilliard Resigns Office At Carnegie-Illinois

• • • **Thomas J. Hilliard** has resigned his office of vice president in charge of sales of Carnegie-Illinois Steel Corp., a subsidiary of U. S. Steel Corp. "During his years of service with Carnegie-Illinois, Mr. Hilliard's leadership in sales has been a strong influence in the company," declared C. R. Cox, president of the U. S. Steel subsidiary, in regretfully announcing the resignation.

A lifetime resident of Pittsburgh, Mr. Hilliard received his education at St. Paul's School, Concord, N. H., and Princeton University, where he graduated in 1917. He served in the U. S. Air Force during World War I and after leaving the service in 1919, he became interested in the oil business. He was president successively of the Carhile Petroleum Co., Pittsburgh, Oil & Refining Co. and Waverly Oil Works Co.

Thomas J. Hilliard

In 1931 Mr. Hilliard became sales manager and vice president of C. Hommel, Pittsburgh, and a year later joined Standard Steel Spring Co., Cora, Pa., as executive vice president. He joined Carnegie-Illinois in 1936 as manager of sales for the Pittsburgh district. He was made general manager of sales for the company in 1938 and was elected vice president in 1945.

50 YEARS AGO

THE IRON AGE, *June 8, 1898*

• "The new Fellows Gear Shaper marks a radical departure from the usual methods of gear cutting. Generating a gear with a revolving reciprocating cutter engaging a like revolving blank yields a theoretically perfect tooth. In its mechanical construction the machine admirably executes the principle upon which it was founded."

• **"The Southern pig iron producers are wilfully sacrificing their opportunities. At the present time they have the Chicago market almost completely to themselves. However, fighting seems to be their normal condition as they are fighting with each other when they are not warring with their Northern competitors."**

• "Under the present conditions the cost of producing iron castings must be reduced, according to the Michigan Stove Co., or it will be necessary to show very small profits in the future. If wages are not reduced, methods must be found which will require fewer men to produce the same number of castings and waste must be reduced. The company is introducing labor saving devices at every point to accomplish these ends."

• **"Some comment is being made on the fact that a new brass foundry just started in a Western city will employ a force of women as core makers. This work is by no means dainty, and plenty of occupations of a more attractive character might be selected, but the making of small cores is something to which the deftness of feminine fingers is peculiarly adapted."**

• Production of open hearth steel ingots and castings in the U. S. in 1897:

New England, New York, New Jersey	51,402 tons
Pennsylvania	1,294,923 tons
Ohio	78,357 tons
Illinois, Other States	47,031 tons
Total	1,631,843 tons

Purchase Facilities At Glassport from WAA

Washington

• • • **Pittsburgh Steel** Foundry Corp., Glassport, Pa., has purchased the government-built steel producing facilities at their plant for $1,250,000, War Assets Administration has announced.

The property sold consists of approximately 6.5 acres of land, foundry extension building, a machine shop known as "the arsenal," office and laboratory sub-station, minor structures and machinery and equipment including heat-treating furnaces, one double-end car type core oven, sand conveyors and conditioners, four stationary type speedslingers and other items.

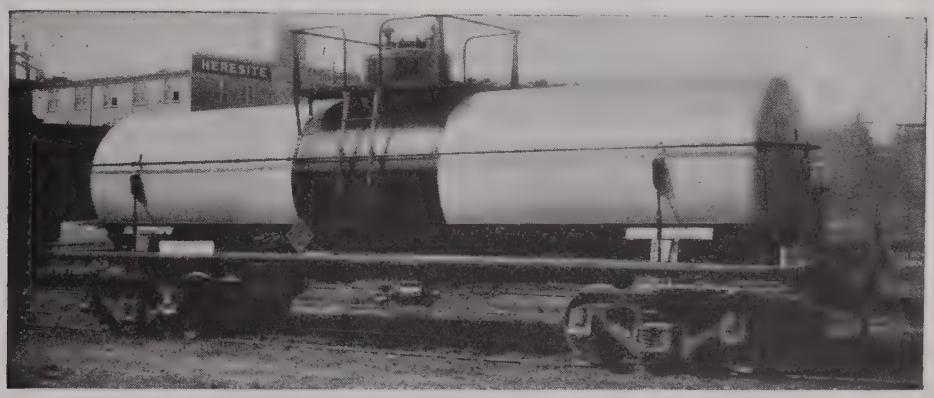
The facilities will be used for the production of steel castings and steel mill equipment.

HERESITE

REG. U. S. PAT. OFFICE

Permanent LININGS FOR TANK CARS

INSIDE AND OUTSIDE



RESISTANCE

Heresite linings effectively prevent product contamination of such items as concentrated Sulphuric Acid, Rubber Latex, Formaldehyde, Lactic Acid, Battery Acid, Acetic Acid, Vinegar, Fruit Juices, and Wine. Tank cars lined 5 years ago are still in daily service.

EASE OF CLEANING

These tank cars are quickly cleaned by Steaming, Hot Water or any type of Solvent.

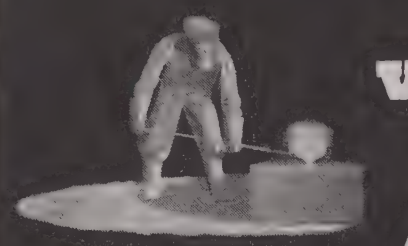
SYNTHETIC RUBBER LINING

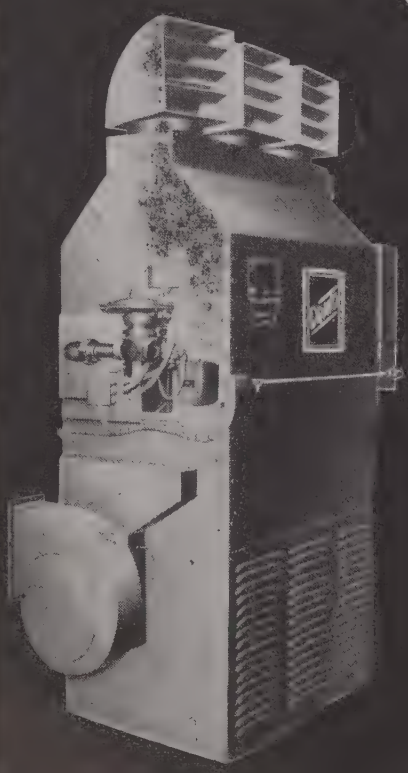
A recently perfected rubber lining will adequately transport caustic ingredients such as crystalline Sodium Hydroxide.

HERESITE & CHEMICAL COMPANY

MANITOWOC, WISCONSIN

foundry ventilating with DRAVO Counterflo HEATERS





Here are some of the DRAVO features important in foundry heating and ventilating:

- Introduction of clean, tempered fresh air to replace exhausted air
- Heaters easily installed directly in working areas or connected to a distributing duct system
- Air-handling capacities ranging up to 22,000 CFM per unit
- Gas, oil, or combination burner systems for direct-firing in stainless steel combustion chambers

When you establish comfortable working temperatures year round it's certain to show up in improved efficiency and higher morale among workers. In foundries or metal working shops, the reduction of smoke, fumes, and airborne dust by the introduction of clean, tempered fresh air is the first big step in establishing comfortable working conditions.

And you can accomplish these results quite readily by installing Dravo *Counterflo* Heaters. Characterized by their large air-handling capacity, and efficient method of air distribution, Dravo *Counterflo* Heaters are ideally suited for foundry ventilating during summer and winter seasons.

Dravo *Counterflo* Heaters can be shipped from stock so that you can take full advantage of the ventilating features during every season and have adequate heat available, instantly, when it's needed. Write or wire for descriptive Bulletin IH-516.

Dravo also manufactures the *DRAVO CRANE CAB COOLER* for air conditioning hot-metal crane cabs.

DRAVO CORPORATION

Pittsburgh · Cleveland · Philadelphia · Detroit · New York · Chicago
Atlanta · Boston · *Sales Representatives in Principal Cities*

DRAVO

Savings in Materials Handling Costs Discussed at ASME Meeting

. . . Savings in materials handling offer industry the key to a reduction of its overall production costs speakers emphasized at a technical session of The American Society of Mechanical Engineers, which opened its six-day Semi-Annual Meeting here today.

Frank M. Blum, manager of the crane sales division of the Harnischfeger Corp., Milwaukee, in a paper on "Materials Handling Through the Air" described the various types of monorail hoists and overhead traveling cranes. He said

"Time study men all over the country are trying to see how the machining time of various pieces of manufactured goods can be reduced in order that the cost of that piece might become lower and the ultimate cost to the consumer reduced.

"A recent survey in 120 factories revealed that materials handling costs, in the average plant, are actually about 36.3% of the overall production cost instead of the 25% that had been previously acknowledged by industry. Engineers are becoming more and more conscious of the cost of materials handling. This is probably because they well realize that they have squeezed the last drop of blood out of production efficiency in machine tools and machine tool equipment. They are looking for other places for savings and certainly the savings in materials handling in a plant are vast."

Illustrating, he said that a man flew from Cleveland to Detroit in 28 minutes, but it took him nearly three hours extra in time consumed in finding transportation, getting to and from airports, handling luggage and waiting for the plane.

"Figuratively speaking, the 'machine time' was excellent but here is the catch. The entire trip took 28 minutes actual flying time, plus 2 hours and 50 minutes 'handling time.' The handling time was way out of proportion to the machining time."

He urged that in purchasing materials handling equipment, it should be evaluated on a basis of service duty classification, keeping in mind the use for the job to be performed, rather than on initial expense.

UNION PACIFIC

The Governor of California *invites You*

State of California
GOVERNOR'S OFFICE
SACRAMENTO

EARL WARREN
GOVERNOR

To American Industry:

In California we are currently celebrating the centennial anniversaries of the beginnings of our State. We gain much inspiration from our review of the progress which has been made in the comparatively short span of one hundred years.

During the past eight and one-half years alone California's population has increased by 47 per cent and our industry and agriculture have risen to positions of great importance in the economic life of the nation.

Our tremendous reserves of natural resources and our strategic world trade position on the shores of the Pacific Basin assure California's continued progress in the years to come.

I am happy, therefore, to join in inviting you to investigate the opportunities for expansion which exist in the many communities of our State.

Sincerely,

Governor

Earl Warren

* *One of a series of advertisements based on industrial opportunities in the states served by Union Pacific Railroad.*

Unite with Union Pacific in selecting sites and seeking new markets in California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, Oregon, Utah, Washington, Wyoming.

*Address Industrial Department, Union Pacific Railroad
Omaha 2, Nebraska

UNION PACIFIC RAILROAD

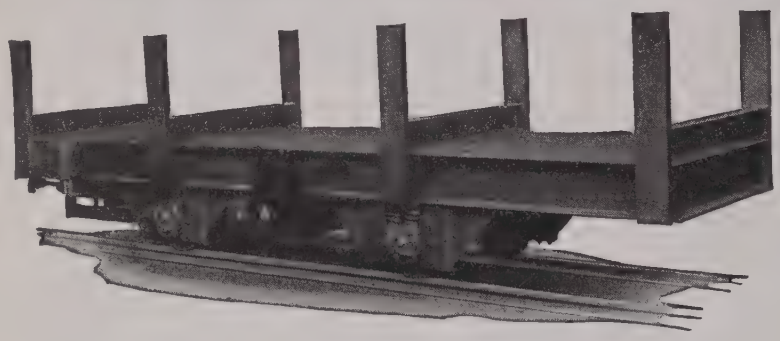
Road of the Daily Streamliners

ATLAS

INTRAPLANT HAULAGE EQUIPMENT

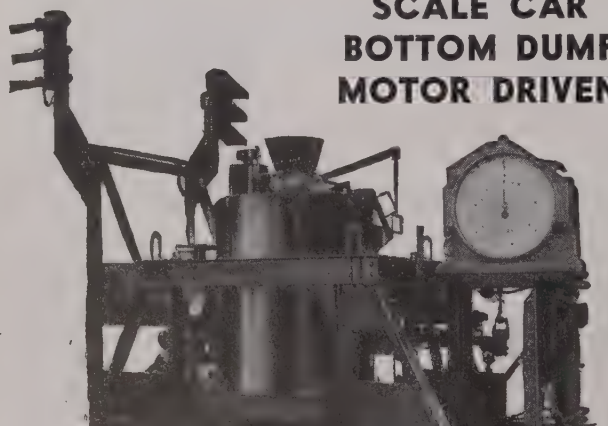
SPEEDS PRODUCTION

10 TON STORAGE BATTERY FLAT CAR



Built for handling pipe and conduit. Powered by storage battery. Geared to travel at walking speed when controller is held in operating position. Automatic "shut-off" and brake applied when spring return handle of the controller is released.

ELECTRIC SCALE CAR BOTTOM DUMP MOTOR DRIVEN



36 CU. FT. CAPACITY

For use in chemical plants. Cylindrical type body with dust filter. Mounted on Atlas Scale with 24" Atlas Dial and type-printing recorder. Car equipped with brakes, levers for operating discharge and loading chutes.

ATLAS ENGINEERING SERVICE
IS ALWAYS AT YOUR SERVICE

THE ATLAS CAR & MFG. CO.

ENGINEERS MANUFACTURERS

1130 IVANHOE RD. CLEVELAND 10, OHIO, U. S. A.

PERSONALS

• **F. O. Nelson** has been appointed representative for the Chicago district of the Duraloy Co., Scottsdale Pa. Formerly he was representative for the Pittsburgh Metallurgical Co

• **Earl O. Shreve,** vice-president of the General Electric Co. on the president's staff, has retired after 44 years of service. Mr. Shreve has been on special assignments with headquarters in New York.

• **Edward J. Sherrill** has been appointed superintndent of scheduling and shipping and **Norris B. McFarlane,** superintendent of electric furnace department, Jessop Steel Co., Washington, Pa. Mr. Sherrill had been with the Buffalo plant of the Wickwire Spencer Steel Div of the Colorado Fuel & Iron Corp Mr. McFarlane was recently superintendent of the electric furnace department of Universal - Cyclops Steel Corp.

• **Charles S. Weber** has been named advertising manager of the Thew Shovel Co., Lorain, Ohio. He was formerly production manager of the White Advertising Co.

• **Carl H. Krause** has been appointed works manager of the newly-established New York works of the Trumbull Electric Mfg. Co Inc. Prior to his present appointment he was a supervising engineer at the Kearny, N. J. plant of the Western Electric Co. The New York works of Trumbull Electric is located at Maspeth, Long Island.

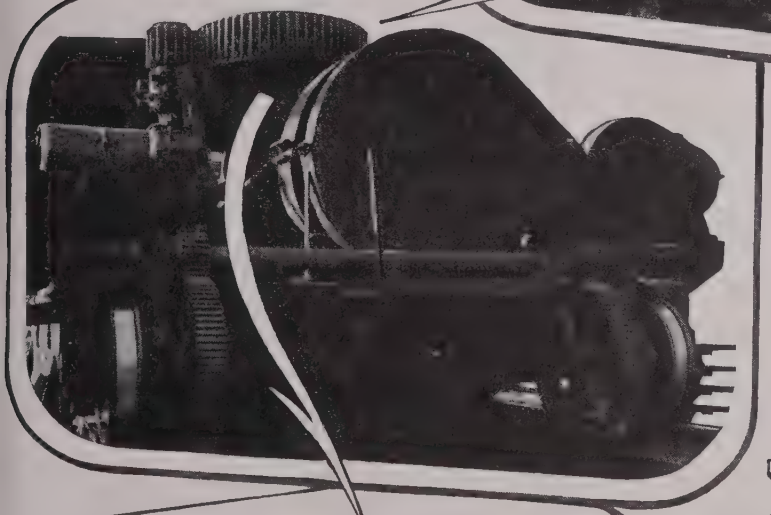
• **R. M. Neyhart** has been made assistant sales promotion manager for service for Nash Motors Div. Nash-Kelvinator Corp., Detroit. Mr Neyhart joined Nash in 1947 as a district manager for the Philadelphia zone.

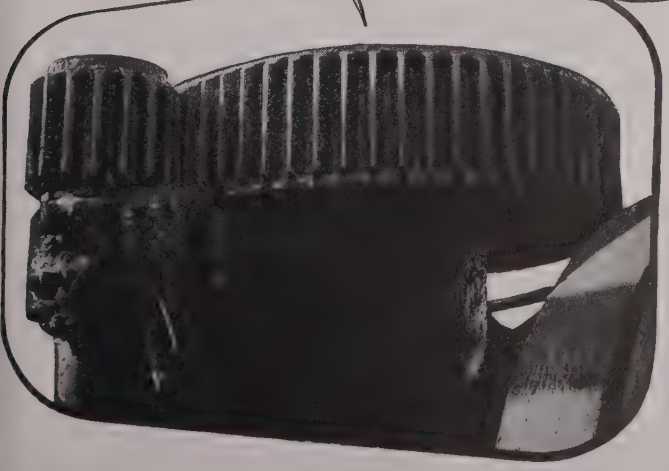
• **Preston W. Wolf** has been appointed executive assistant to the vice-president of the General Detroit Corp. sales department, Detroit. For the past 2 years he was sales promotion manager, and he will retain sales promotion and advertising responsibilities in his new position. **H. J. O'Neill** has been appointed field sales manager. Mr O'Neill has been with General Detroit since 1942, during which time he has acted in various supervisory capacities. **Eric Park** has been made eastern region representative with headquarters in New York, and **Clifford Hain** has been appointed midwest representative with headquarters in Chicago.

• **Raymond A. Quadt** has been appointed assistant manager of Federated Metals Div.'s general aluminum department, American Smelt

Stripper Crane GEARS

by NE





Weirton Steel Stripper Crane

Driven by Tough Neloy Gears

THESE heavy duty crane gears take a round-the-clock beating in the Weirton Steel Company stripper yard. *Weirton Steel has used Neloy 10B gears flame hardened in crane applications for 15 consecutive years.* Cast, machined and flame hardened by National-Erie, they give proof each day of the dollar value to be posted as a bonus when you select the correct metal specially heat treated at NE to meet your requirements. Neloy or Neloy Moly is the choice of the designers of heavy industrial equipment because it actually costs less in the long run. Its production from raw material to finish machined and heat treated or flame hardened gears is controlled wholly within the National-Erie plant. Your special requirements are to us an opportunity to prove our value to you—consult with us. Bulletin No. 9 gives facts and figures on Neloy and Neloy Moly. Write for it!

NATIONAL ERIE CORPORATION

ERIE, PENNSYLVANIA • U. S. A.

HALLDEN
Automatic Shears

why HALLDEN LEADS

CONTINUOUS FEED

Continuous feed of metal through the machine is obtained by synchronizing the flattener with the flying shear, eliminating "stop and start" cutting.

CUTTING ACCURACY

Cutting accuracy up to 1/64" plus or minus is obtainable with the Hallden Automatic Shear. After cutting, metal is conveyed or stacked, depending upon the customer's requirements.

FLEXIBLE DESIGN

Flexible design allows quick change of shear knives and ease in removal of flattening rolls for grinding. Shear knives have four cutting edges and always move in a mutual plane.

RUGGED CONSTRUCTION

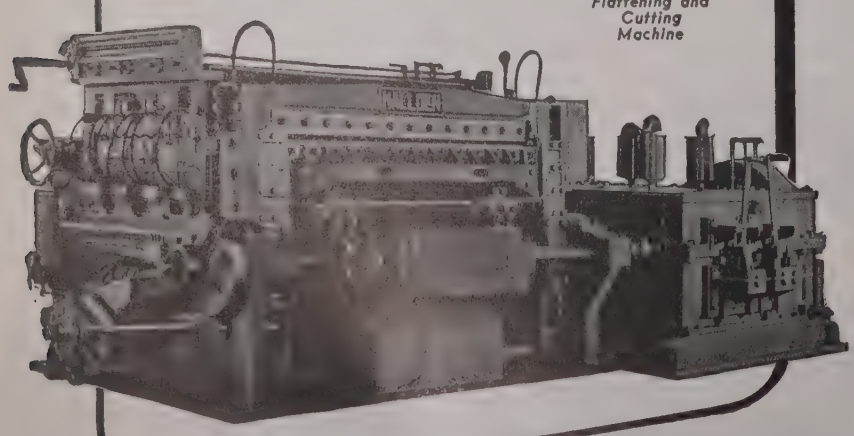
Rugged construction permits continued hard use with little attention other than lubrication. Flattening rolls are individually driven to keep maintenance to a minimum.

THE HALLDEN MACHINE COMPANY
THOMASTON, CONN.

Sales Representatives

The Wean Engineering Co., Inc., Warren, O.
W. H. A. Robertson & Co., Ltd., Bedford, England

Typical Hallden Automatic Flattening and Cutting Machine



ing & Refining Co., New York. He started with the company in 1942. In addition to his new administrative duties, he will continue in large measure the research and sales engineering activities of his former post.

• **Mel W. Lewis** has been promoted to branch manager of the Cleveland factory branch office of General Controls Co. Mr. Lewis has been associated with General Controls in San Francisco for the past 10 years.

• **J. C. Farley** has been appointed general manager of the radio division, Sylvania Electric Products Inc., Emporium, Pa. He was formerly controller of the radio division.

• **Felix Wunsch,** engineer and inventor who has spent nearly 43 years with Leeds & Northrup Co., Philadelphia, has retired. **Paul V. Roth,** since 1919 shop engineer of Leeds & Northrup, has also retired after nearly 46 years of service with the company.

• **Price D. Garland,** arch and wall engineer at Laclede-Christy Clay Products Co.'s Indianapolis office, has been transferred to Pittsburgh.

• **Frank J. Sikorovsky,** president and general manager, Amco Twist Drill Corp., recently acquired by Greenfield Tap & Die Corp., Greenfield, Mass., has been made a director of the latter firm.

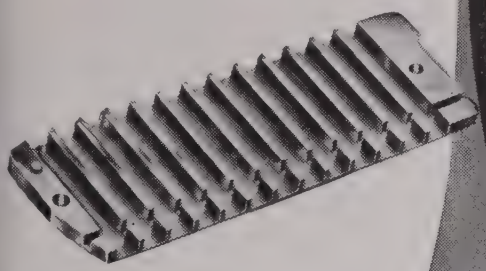
• **Peter S. Richards** has been appointed manager of the new warehouse opened by the A. B. Murray Co. at Versailles, McKeesport, Pa.

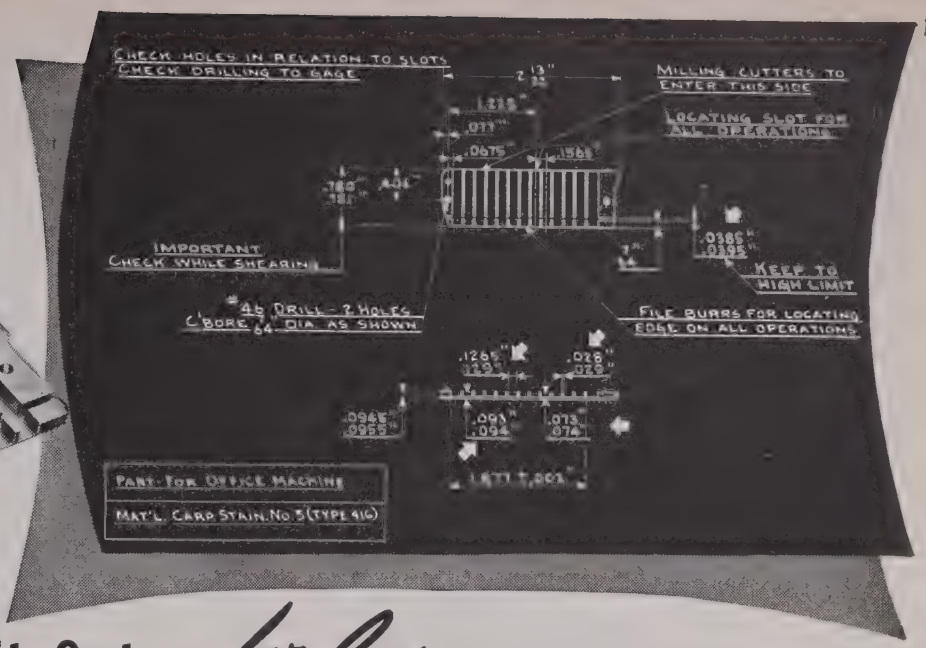
• **Paul R. Oliver** has been appointed West Coast manager of Farrel-Birmingham Co., Inc., with his headquarters at Los Angeles. Mr. Oliver has worked as service engineer for Farrel-Birmingham since 1942.

• **J. A. Borden** has been elected vice-president in charge of the Scotch tape division of Minnesota Mining & Mfg. Co., St. Paul. He joined the firm in 1925 and for 7 years has been sales manager for Scotch tapes. **J. C. Duke** has been elected vice-president in charge of the "3M" coated abrasives division. He joined Minnesota Mining & Mfg. in 1921 and has been sales manager for the company's surface-coated abrasive paper and cloth.

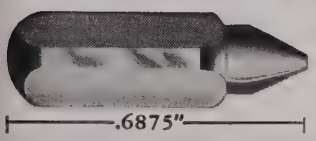
• **Dwain E. Fritz,** for the past 2 years manager of the aircraft motor and generator section, aviation engineering department, at Westinghouse Electric Corp., has joined

Drilling and milling to these close tolerances was once a prize headache But now each operation is done faster because of the *consistent uniformity* of Carpenter Free-Machining Stainless No. 5.




CHECK HOLES IN RELATION TO SLOTS
CHECK DRILLING TO GAGE
MILLING CUTTERS TO ENTER THIS SIDE
LOCATING SLOT FOR ALL OPERATIONS
IMPORTANT
CHECK WHILE SHEARING
KEEP TO HIGH LIMIT
#46 DRILL - 2 HOLES
C'BORE 64 DIA AS SHOWN
FILE BURRS FOR LOCATING EDGE ON ALL OPERATIONS
PART-FOR OFFICE MACHINE
MAT'L. CARP STAIN. NO. 5 (TYPE 416)

You Can Turn It Out *for less* with Carpenter Free-Machining Stainless



The point on this carburetor needle is made to close tolerances and the needles are produced economically, thanks to the easy machining properties of Carpenter Stainless No. 5. The special cold drawn shape as supplied from the mill also reduced the total amount of machining needed on the job.

• Easier Stainless Fabrication • Lower Unit Costs

Helping you to machine parts from Carpenter Stainless at less cost is as much a part of our work as the making of uniform, easy-cutting Stainless Steels. So whenever you run up against a problem of selecting and working with the Stainless that will do your job best, make full use of our experience Your nearby Carpenter representative can give you personal help in the shop and supply you with printed information to help you shave costs on each Stainless machining operation. For example . . .

Here's complete information to help you machine stainless steel at less cost . . .

This NOTEBOOK contains useful information, much of it never before published. It will give you hints to take the kinks out of Stainless machining jobs, reduce rejects and cut costs.

Your nearby Carpenter representative will be glad to give a personal copy of the "NOTEBOOK on Machining Stainless Steels" to Production and Management Executives. And after you have used the NOTEBOOK, if you want additional copies for the men in your plant, they can be secured at 50¢ apiece.

THE CARPENTER STEEL COMPANY, 121 W. BERN STREET, READING, PA.

Carpenter

FREE-MACHINING

STAINLESS STEELS

more than corrosion resistance

Branches: Boston • Bridgeport, Conn. • Buffalo • Chicago • Cincinnati • Cleveland Dayton • Detroit • Hartford • Indianapolis • Los Angeles • New York • Philadelphia Providence • St. Louis • Worcester, Mass.

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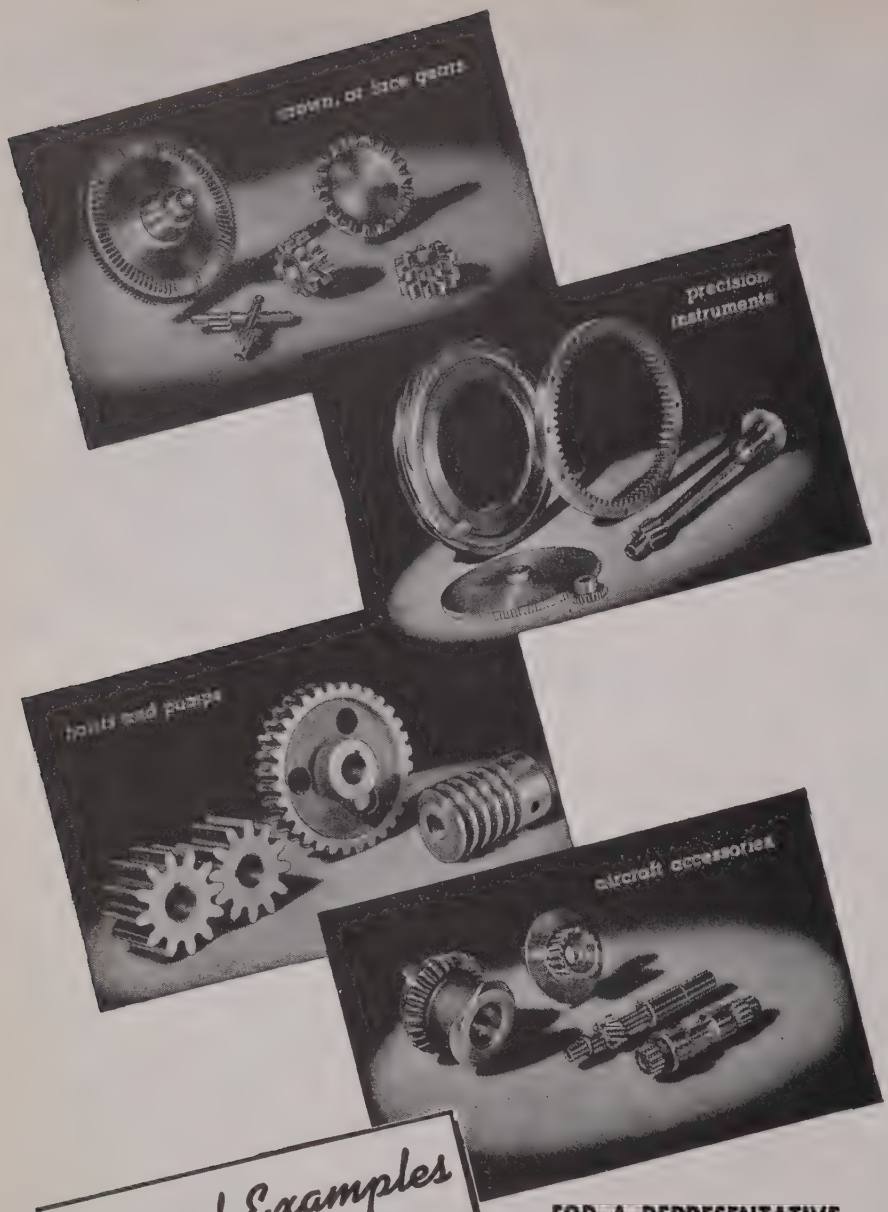


Typical Examples of PERKINS *custom-cut* GEARS

FOR A REPRESENTATIVE NUMBER OF MANUFACTURED PRODUCTS

We have specialized in the mass production of precision gears to customers' specifications for nearly 30 years. Our equipment, facilities and experience enable us to fill orders for any type of gear in any quantity and material—metallic or non-metallic. Once your specifications are in our files, re-orders are filled automatically. Let us quote on your requirements now.

YOU FURNISH THE SPECIFICATIONS — WE'LL PRODUCE THE GEARS

PERKINS Precision, Custom-Cut GEARS

PERKINS MACHINE & GEAR CO., Springfield 2, Mass.

——— PERSONALS ———

the development engineering staff of Jack & Heintz Precision Industries, Inc., Cleveland, as manager of the special aviation projects section. **John K. McNeely** has joined Jack & Heintz as special aviation project engineer. Mr. McNeely had been chief electrical engineer at Harvey Machine Co. since 1944.

• **Joseph M. Dodge** has been elected a director of Chrysler Corp., Detroit. He is president of the Detroit bank.

• **William Wendt** has been appointed district manager for the southwestern states of Texas, New Mexico, Oklahoma, Arkansas and Louisiana for the Ready-Power Co. of Detroit.

• **S. Hoyt Price** has been named manager of the Omaha district of the replacement tire sales division of B. F. Goodrich Co. and **Bert Christopher** has been named manager of the Oklahoma City district. Mr. Price had been manager at Oklahoma City previous to his latest appointment, and Mr. Christopher had been store supervisor in the Kansas City district.

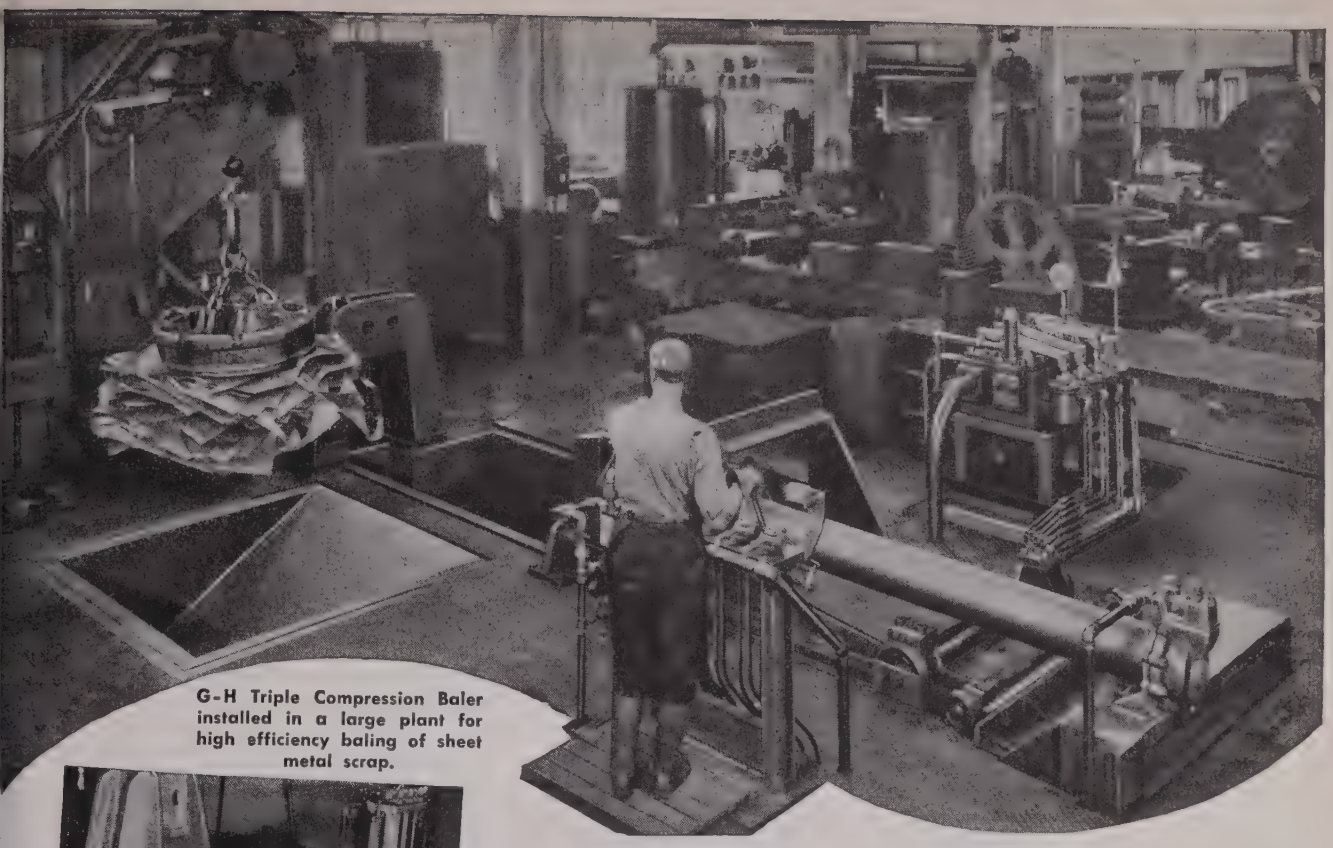
• **William D. Wilson** has been appointed district sales representative in Northern New Jersey and New York City for the special chemicals division of the Pennsylvania Salt Mfg. Co., Philadelphia. Before joining Pennsalt last January, he was a chemist with the McCormick Rubber Co. for 11 years. **John M. Davidson** has been named Pittsburgh district sales representative for the special chemicals division. He was formerly the sales representative in the Northern New Jersey and New York City territory.

• **Laura A. Orbach,** former president of Clark-Wells Metal Co., has joined the St. Louis office and warehouse staff of C. G. Hussey & Co.

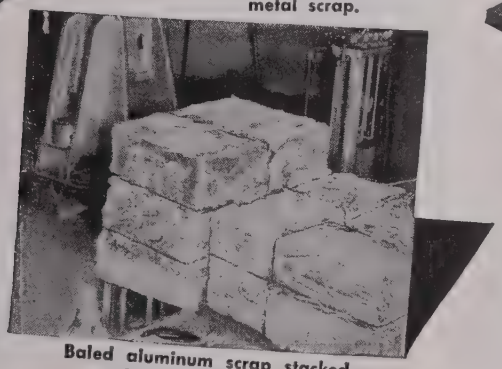
• **Harold J. Newton,** sales manager of National Electric Products Corp., Pittsburgh, has been elected a vice-president of the corporation.

• **E. E. Parsons, Jr.,** director, and **Robert W. Kerr,** vice-president and director of Bingham-Herbrand Corp., have been made directors of Billings & Spencer Co., Hartford.

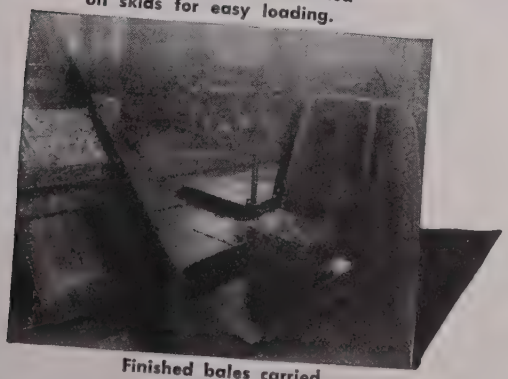
• **Reese B. Lloyd** has been appointed manager of plants, and **R. J. Seltzer,** manager of product design and development of Rheem Mfg. Co., making their headquarters at the South Gate, Calif. plant. Mr. Lloyd joined Rheem in 1944 and most recently has been man-



G-H Triple Compression Baler installed in a large plant for high efficiency baling of sheet metal scrap.



Baled aluminum scrap stacked on skids for easy loading.



Finished bales carried to cars by conveyor.

Baled Sheet Metal Scrap is Vital to Production . . .

A steady, adequate flow of properly prepared scrap metal, both ferrous and non-ferrous, to the mills, smelters and foundries is highly essential to meet the increasing demand for new metal and castings. Today it is indispensable in maintaining high-level industrial production.

A most desirable type of "scrap" is *sheet metal scrap* in the form of dense, compact bales . . . correctly sized and classified. It can be used immediately, without extra handling or preparation, to charge furnaces or cupolas. That's why it always commands premium prices.

If your daily accumulation of sheet metal stampings or clippings amounts to 5 tons or more, you will find it profitable to bale it the G-H way. Furthermore, you will be contributing to your own continuous supply of new metal!

For experienced Counsel on your Baling Problems, consult—

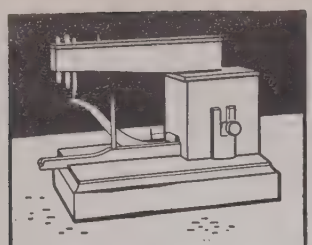
GALLAND-HENNING MFG. CO.
2747 S. 31st STREET • MILWAUKEE 7, WIS.

. . . builds Hydraulic Scrap Metal Balers in a complete range of sizes and capacities from ¼ ton to 20 tons per hour and more.

GALLAND-HENNING

SCRAP METAL BALING PRESSES

A5247-1P

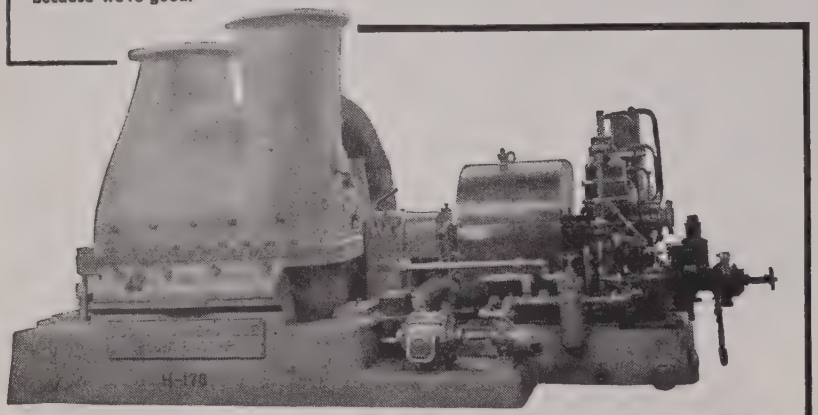


In 1858, Lyman R. Blake invented the original machine for sewing shoe soles to uppers. The first Roots Blower was built four years before that, in 1854. We're not good because we're old, but old because we're good.

YOU CAN COUNT ON

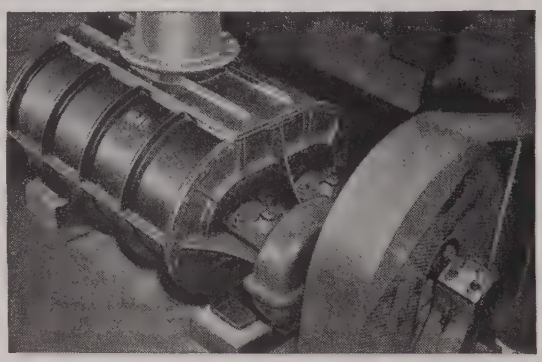
R-C dual-ability

FOR UNBIASED ANSWERS



(Above) R-C Centrifugal, 4-stage Gas Booster in southern steel plant. Steam turbine driven, capacity 11,100 CFM.

(Right) Typical R-C Rotary Positive Blower used for gray iron cupola service.



Our sales engineers don't need to "hedge" on recommendations for blowers, exhausters or gas boosters. That's because of R-C *dual-ability* to supply either Centrifugal or Rotary Positive units. This *dual choice* permits the selection of the right type of equipment to match your specific requirements . . . and it is an exclusive R-C advantage.

Our extensive line of standard units, both Centrifugal and Rotary, meets most needs, without special designs. You can use any modern drive —direct-connected motor, V-belt or steam turbine.

So, for blowers, exhausters or gas boosters, you can count on R-C *dual-ability*. You'll get equal satisfaction from R-C Rotary Positive Meters and Vacuum Pumps and Inert Gas Generators. There's almost a century of blower-building experience at your service.

ROOTS-CONNERSVILLE BLOWER CORPORATION
806 Ohio Avenue, Connersville, Indiana

ROOTS-CONNERSVILLE
ROTARY CENTRIFUGAL
BLOWERS · EXHAUSTERS · BOOSTERS · LIQUID AND VACUUM PUMPS · METERS · INERT GAS GENERATORS
BLOWER BUILDERS R-C SINCE 1854
★ ★ ONE OF THE DRESSER INDUSTRIES ★ ★

PERSONALS

ager of western plants. Mr. Seltzer joined the company in 1938 and recently was manager of all eastern plants.

• **David A. Winton,** superintendent of Warren Steam Pump Co., Inc., Warren, Mass., has retired after 33 years of service.

• **Lewis P. Chick** has been appointed factory representative in Indiana for the Adalet Mfg. Co., Cleveland. He was formerly Chicago district sales manager for the Electric Corp. of America.

• **H. Arthur Howe** has been appointed manufacturing manager of the General Electric Co.'s compound division, Pittsfield, Mass. He has been superintendent of the division since 1947.

• **Harrison N. Van Duyne** has been named plastic sales engineer for the eastern division by the Drackett Products Co. He will work out of Towaco, N. J. Mr. Van Duyne formerly held a similar position with the Boonton Molding Co.

• **Roy W. Jacobs** has been appointed to the board of directors of the Fruehauf Trailer Co., Detroit. Mr. Jacobs, who is secretary and assistant treasurer, entered the Fruehauf organization as a bookkeeper in 1923.

Obituaries

• **William A. Crawford,** 86, cofounder, treasurer and chairman of the board of Griffin Mfg. Co., Erie, Pa., died May 6.

• **A. H. Ferbert,** president of the Pittsburgh Steamship Co., Cleveland, subsidiary of U. S. Steel Corp., died May 23.

• **James J. Hughes,** sales agent in Chicago for the past 26 years for the Ohio Steel Foundry Co., McConway & Torley Corp., and Davis Brake Beam Co., died May 18.

• **Joseph W. McRobbie,** 56, director of purchases for American Blower Corp., Detroit, died recently.

• **William C. A. Busch,** 69, superintendent, construction department, Lukens Steel Co. and its divisions, By-Products Steel Co. and Lukenweld, Coatesville, Pa., died May 20.

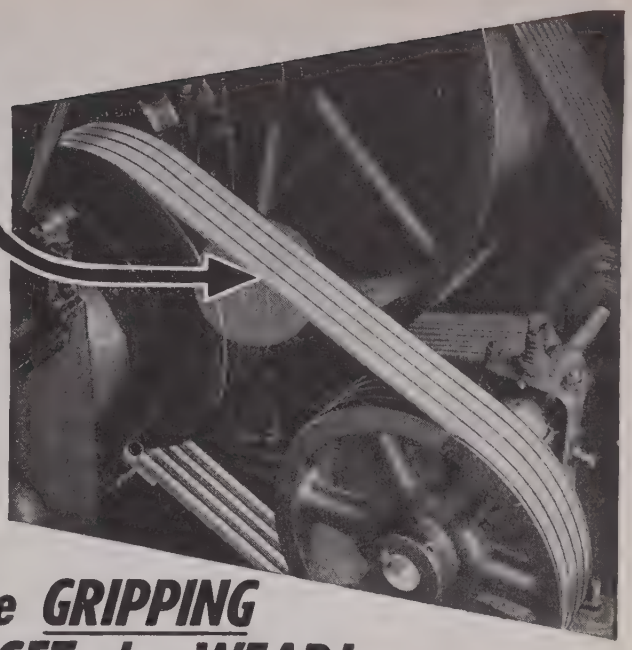
• **Austin W. Ford,** 85, a director of International Business Machines Corp., Binghamton, N. Y., since its inception, died May 24.

• **Carl F. Johnson,** 54, superintendent of assembly, machine division, Norton Co., Worcester, died May 10.

THE SIDES of a V-BELT

Diagram of V-Belt in Sheave-Groove

Are ALL that TOUCH the Pulley



The SIDES Do ALL the GRIPPING Naturally — They GET the WEAR!

The moment you look at a V-Belt in its sheave, you see that the *sides* are the only part that ever *touch* the pulley. The *sides* do all the *gripping*—they get *all the wear* against the sheave groove wall. The sides *pick up* the load. They transmit that load to the belt as a whole. And then, once more, the sides—and the sides alone—take hold of the driven pulley and deliver the power to it.

That is why you have always noticed that the sidewall of the *ordinary* V-belt is the part that *wears out first.*

That's Why the CONCAVE SIDE

A GATES PATENT

Is IMPORTANT to You

Since the sidewall is the part that wears out first, anything that prolongs the life of the sidewall will naturally lengthen the life of the belt.

The simple diagrams on the left show exactly why the ordinary, straight-sided V-belt gets excessive wear along the *middle* of the sides. The diagrams show also why the Patented Concave Side greatly *lengthens the life* of the *sidewalls* of Gates Vulco Ropes. That is the simple reason why your Gates Vulco Ropes are giving you so much longer service than any straight-sided V-belt can possibly give.

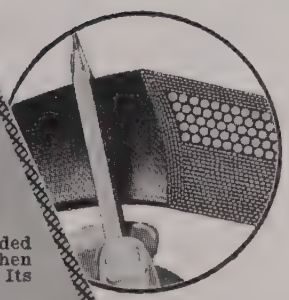
The Concave Side is Even MORE IMPORTANT Now that SUPER VULCO ROPES *Are Available!*

Now that Gates *SPECIALIZED* Research has resulted in Super Vulco Ropes capable of carrying much heavier loads—fully 40% higher horsepower ratings—the sidewall of the belt is called upon to do even more work in transmitting these heavier loads to the pulley. Naturally, with heavier loading on the sidewall, the life-prolonging Concave Side is more important now than ever before!

Fig. 1

Straight Sided V-Belt

Fig. 1-A



How Straight Sided V-Belt Bulges When Bending Around Its Pulley

You can actually feel the bulging of a Straight-sided V-Belt by holding the sides between your finger and thumb and then bending the belt. Naturally, this bulging produces excessive wear along the middle of the sidewall, as indicated by arrows.

Fig. 2

Gates V-Belt with Patented Concave Sidewall

Fig. 2-A

Showing How Concave Side of Gates V-Belt Straightens to Make Perfect Fit in Sheave Groove When Belt is Bending Over Pulley.

No bulging against the sides of the sheave groove means that sidewall wear is evenly distributed over the full width of the sidewall — and that means much longer life for the belt!

The Gates Rubber Company

"The World's Largest Makers of V-Belts"

DENVER, U. S. A.

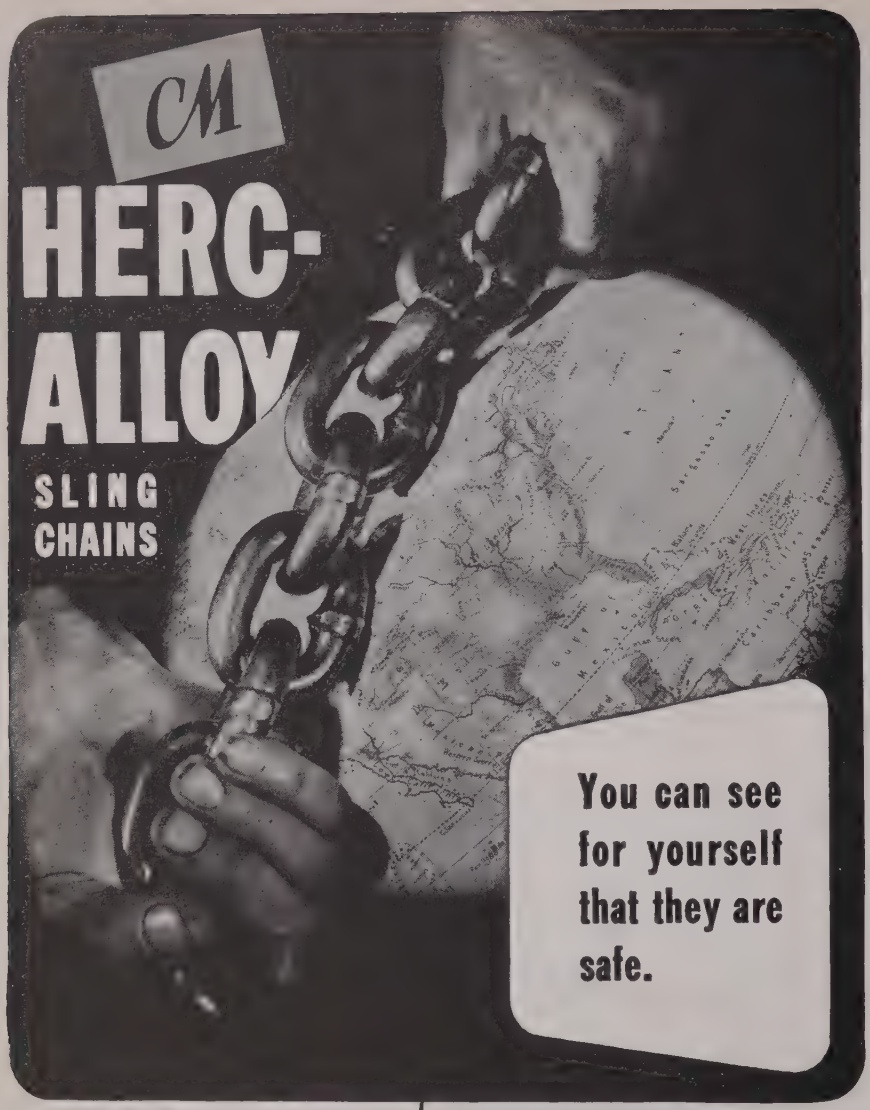
483

Gates

THE MARK OF SPECIALIZED RESEARCH

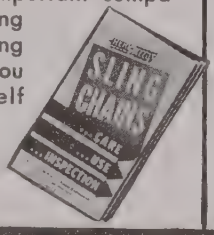
GATES VULCO ROPE DRIVES

Engineering Offices and Jobber Stocks IN ALL INDUSTRIAL CENTERS of the U. S. and 71 Foreign Countries



● Just one of the big advantages of HERC-ALLOY Sling Chains is that you can determine their serviceability by a simple visual inspection.* Ordinary steel or iron chains, on the contrary, grow dangerously brittle with age... an insidious threat to the safety of men and materials. That's why more and more of the important companies are standardizing on HERC-ALLOY Sling Chains...because you can see for yourself that they're safe.

*Write for your copy of this new, informative booklet. No charge.



HERC-ALLOY FEATURES

- America's *first* alloy steel sling chain...first to bear a serial number.
- Every CM HERC-ALLOY Sling Chain is alloy steel throughout...links, rings, hooks. There is only one grade...*the best.*
- Every chain is individually tested and accompanied by a certificate of registration.
- Links are side welded for maximum strength by patented INSWELL electric method.
- HERC-ALLOY Chains should never be annealed.
- HERC-ALLOY Chains are lighter...stronger... easier to handle...outlast ordinary chains 4 to 5 times...cost less on the job.

HERC-ALLOY...the chain you can *SEE* is safe

COLUMBUS-McKINNON
CHAIN CORPORATION
(Affiliated with Chisholm-Moore Hoist Corporation)
GENERAL OFFICES AND FACTORIES: TONAWANDA, N. Y.
SALES OFFICES: New York • Chicago • Cleveland • San Francisco • Los Angeles

PERSONALS

• **Byron G. Best,** supervisor of safety, Oliver Iron Mining Co., Duluth, Minn., died May 8. He joined Oliver in 1909.

• **Leonard C. David,** assistant manager of Pickands, Mather & Co., Duluth, Minn., died May 7.

• **William E. Chamberlain,** 67, retired vice-president of S. M. Howes Co., Boston, died May 15.

• **George W. Driver,** general manager of the Malleable Iron & Arco steel plant of the American Radiator & Standard Sanitary Corp. in Buffalo from 1929 until 1946, died May 15.

• **Swen W. Nelson,** manager, Buffalo office, Bailey Meter Co., died recently.

• **George W. Kreer,** 61, president of Lafayette Steel Corp., Chicago, died Apr. 26.

• **William G. Humpton,** 67, retired, for many years chief metallurgical engineer of Lukens Steel Co., Coatesville, Pa., died May 5.

• **Ralph L. Riese,** 55, district representative of Fort Pitt Bridge Works, Pittsburgh, died Apr. 27. He had been associated with the company since 1930.

• **Henry B. McGrath,** sales manager of Monroe Calculating Machine Co., Inc., Boston, died May 9.

• **Albert L. Schuh,** 80, treasurer of the Buffalo Scale Co., Buffalo, died May 8.

• **Rudolph M. Ostermann,** formerly vice-president of the Superheater Co. at Chicago, died May 4. He retired from active participation in the company's affairs in 1946.

• **Percy W. Bowers,** 62, president of P. W. Bowers & Co., Inc., New York, died May 17.

Keeps Standby Oil in River

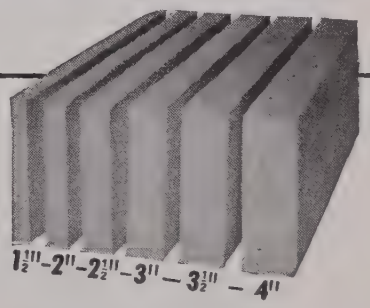
Pittsburgh

• • • **Lacking space** on shore, Pittsburgh Plate Glass Co. has hit on the idea of storing its standby fuel oil in the Allegheny River. The glass company ordered a standard 195-ft welded steel oil barge from Dravo Corp., to be moored to a specially equipped dock at its Creighton, Pa., plant.

Because bunker C fuel oil has the consistency of tar, steam pipes were installed in the barge. The barge has an additional advantage in that it can be towed to and from oil company docks with a saving in transportation costs.

Why the lowest cost open hearth producers use SUPEREX for regenerator insulation

The large size of the Superex blocks saves construction costs



Superex blocks are furnished in various standard sizes and thicknesses

● "Insulate with Superex and you make substantial fuel savings and obtain higher operating temperatures," that's what cost-conscious operators find.

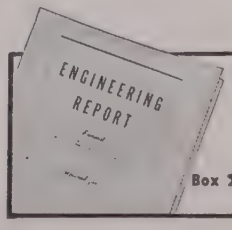
Superex provides these savings year after year. Made of calcined diatomaceous silica and asbestos, it presents a formidable heat barrier. It maintains its high insulating efficiency indefinitely on temperatures to 1900° F. . . . does not disintegrate . . . retains its high physical strength . . . resists the stresses of open hearth and other mill operations.

Higher operating temperatures with Superex result from its ability to reduce air infiltration. This advantage is traced to its unique structure and low permeability.

Superex is light in weight, easily cut and applied . . . comes in convenient standard sizes or may be ordered in irregular shapes.

To help you gain the greatest savings from Superex, Johns-Manville has prepared an engineering report, "Open Hearth Regenerators—a comparison of various insulation specifications." This report indicates the economic thickness of Superex to use as related to the costs of various types of fuels. To obtain this booklet, write Johns-Manville, Box 290, New York 16, N. Y.

JOHNS MANVILLE JM PRODUCTS



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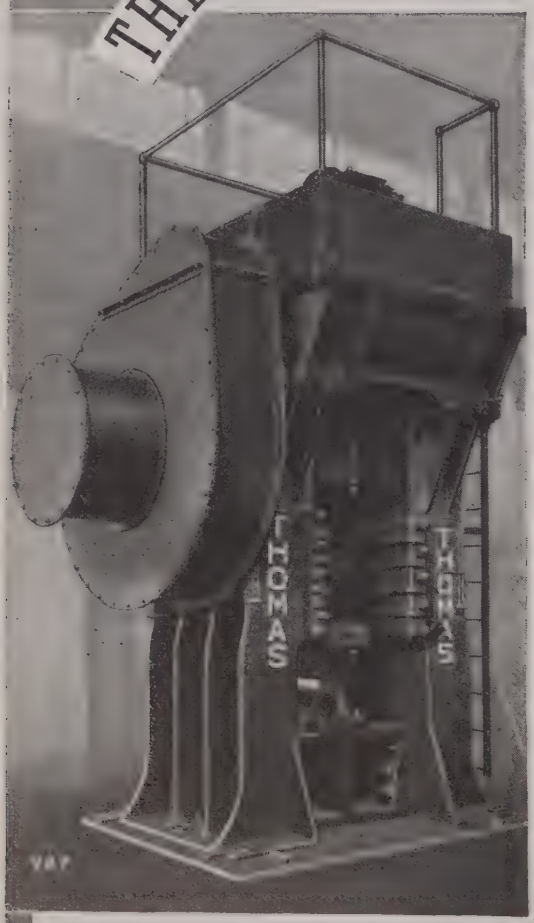
JOHNS-MANVILLE
Box 290, New York 16, N. Y.

JOHNS-MANVILLE *First in* **INSULATIONS**

Thomas scores another FIRST!

THE NEW T-D BILLET SHEARS



New

- in accessibility
- in floor-space economy
- in vital safety features
- in improved construction

Illustration shows 1200-ton T-D Billet Shear in large steel mill, used for obtaining test coupons from rollings of structural shapes.

● Once again Thomas pioneers a radical improvement in design . . . this time it's the new T-D Billet Shear.

All gears and moving parts are completely enclosed and the motor-drive is located overhead. Thus the T-D saves valuable floor space and provides greater safety and accessibility, in addition to lowering operating and maintenance costs.

Ask for further information on this newest Thomas machine for industry!

THOMAS
MACHINE MANUFACTURING COMPANY
PITTSBURGH, 23, PA.

20

PUNCHES · SHEARS · PRESSES · BENDERS · SPACING TABLES

M. I. T. To Institute New Course Teaching Foundry Engineering

Cambridge, Mass.

• • • **Establishment at the** Massachusetts Institute of Technology of a foundry program combined with the courses in metallurgy, mechanical engineering, and business administration to meet the demands for professional training for the foundry industry, has been announced by Dr. T. K. Sherwood, dean of engineering.

In general, engineering training at M.I.T. is designed to provide a broad foundation in the scientific and technical fundamentals of professional fields. While the new foundry program is not intended to be a four-year course in the subject, leaders in the foundry industry feel that the curricula in the departments of metallurgy, mechanical engineering, and business and engineering administration permit the inclusion of an adequate amount of specialized work to fit the student for the foundry industry.

Expansion of the Institute's program in foundry training has been facilitated by active interest on the part of the foundry industry. The Steel Founders' Society of America has contributed to the program in teaching and for student research by presenting the Institute with an electric arc furnace, as well as other equipment, and by the establishment of scholarships.

An equally important aid to the program is a grant from the Foundry Educational Foundation for the purchase and installation of required equipment and the establishment of scholarships. The Foundry Educational Foundation is a joint organization for the promotion of foundry education in America, comprising the Gray Iron Founders' Society, the Malleable Founders' Society, the Foundry Equipment Manufacturers Assn. and the American Foundrymen's Assn.

It is hoped that M.I.T. will have one of the finest foundry laboratories for teaching and research in America. The laboratory will be a part of the newly created Div. of Mechanical Metallurgy under Professor John Wulff, which also includes laboratories in welding, hot and cold working, and powder metallurgy. The division is administered by the Metallurgy Dept. under Professor John Chipman.

Zimmerman Declares Steel Expansion Is On Sound Principles

New Haven, Conn.

• • • **Taking sharp** issue with critics of the American steel industry on the question of capacity, Dr. R. E. Zimmerman, vice-president—research and technology, U. S. Steel Corp. of Delaware, declared recently that the industry has expended vast amounts in the last 8 years to enlarge and improve its facilities. His statement was made in an address before the New Haven, Conn. Chapter, American Society for Metals.

Dr. Zimmerman said that the industry had decided on a sound and orderly course of expansion so as to maintain steel prices at the lowest possible level, as at present. He continued: "Steel production last year represented an increase of over 60 pct over 1939, a thought-arresting comparison.

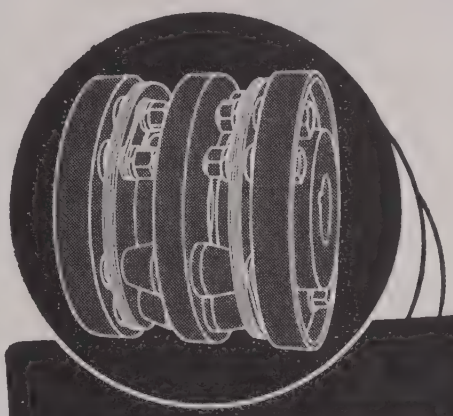
"Last year, operating at an average 93 pct of rated capacity, the steel industry in the United States produced 84,800,000 tons of ingots, or 63,000,000 tons of finished rolled products. That was between 53 and 54 pct of the total world production of steel. The industry knows and readily admits that it was not enough to satisfy all of the existent demands promptly. It was, however, a remarkable peacetime output and, under the conditions, a major accomplishment.

"A look at the statistical record will show that the American steel industry, for many years the largest in the world, has not been accustomed to the unusually rich diet of tonnage developed by the recent World War and its aftermath. Prior to 1940, the twenty-year average was a little less than 43,000,000 tons, about one-half the 1947 production. The top figure reached during the first World War was fifty million and the boom year of 1929, preceding the economic depression, brought forth a peak, up to that time, of sixty-three million tons.

"The year 1939, practically unaffected by the war, witnessed the production of 52,800,000 tons of steel ingots and castings, thirty-two million tons less than the industry produced in 1947. In other words, the figures for last year represent an increase of 60 pct over those of 1939.

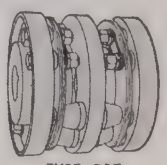
"More than two years ago the various units of the steel industry,

THOMAS
Flexible COUPLINGS
. . . . are specified by engineers, wherever 100% Operating Efficiency is demanded



THOMAS Flexible COUPLINGS provide for Angular and Parallel Misalignment as well as Free End Float . . . and Eliminate BACKLASH, FRICTION, WEAR and CROSS-PULL

NO LUBRICATION IS REQUIRED!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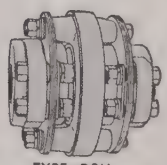
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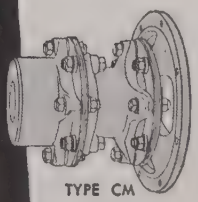
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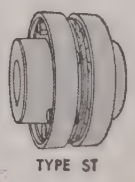
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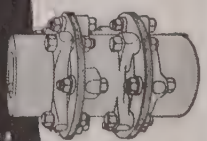
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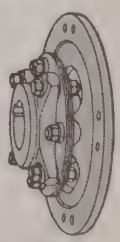
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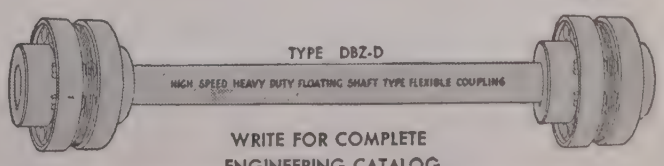

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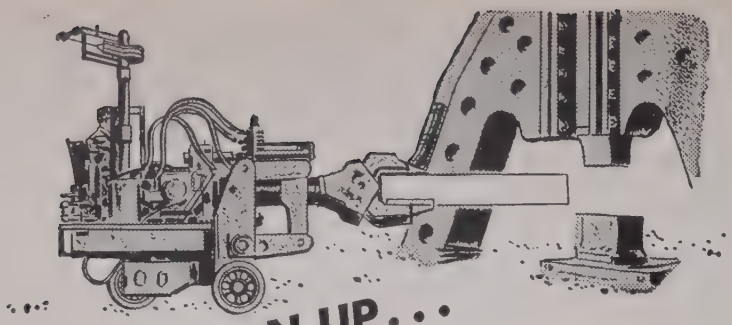

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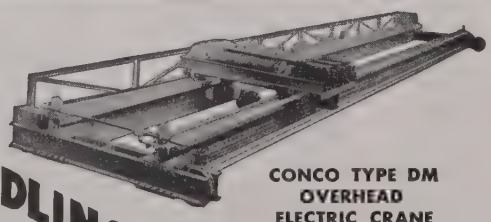

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each and severally in accordance with their respective situations and views, were laying plans for their postwar activities. Progress was much slower than had been anticipated because of shortages of skilled workmen, labor and materials. No one who has not had a part in any such program can have an adequate conception of the difficulties encountered. By Jan. 1, 1948 the total ingot capacity of the industry slightly exceeded 94,200,000 tons, and with the completion of plans now in progress, an additional million tons should be added in each of the years 1948 and 1949. That means a rated steel-making capacity of more than ninety-six million tons early in 1950.

"At an operating rate of 90 pct the ninety-six million ton capacity can produce more than eighty-six million tons of ingots, or in an emergency, at a higher rate, something around ninety-two millions. The prewar tonnages are dwarfed by such figures.

"Ingots cannot be produced by providing simply open hearth, Bessemer, and electric furnace facilities. There must be something to charge into the furnaces,—mainly blast furnace iron and steel-making scrap. The necessary iron can be provided by building more blast furnaces, but they in turn must be fed with ore and coke. Additional ore can be mined if additional mines are developed. There must be additional boats and cars to transport it from the mines to the blast furnaces. More coke, which is in short supply, can be made when enough by-product ovens are built to carbonize or convert the requisite coking coal, which likewise is in short supply and calls for a substantial expansion of mining and transportation facilities.

"The financial side of the picture is interesting. It is a well-known fact that construction costs have been mounting rapidly in recent years. To provide balanced new capacity in a fully integrated steel plant now requires the expenditure of approximately three hundred dollars per yearly ton of salable product. In other words, for a new one million ton installation an investment of around three hundred million dollars would be involved. That is more than three times the per unit investment value of the facilities which produced America's steel just before the second World War.

"What happens under present conditions when a brand new fully integrated steel-producing venture requires approximately three hundred dollars of capital investment per annual ton of finished steel? The depreciation charge against the product produced on the new equipment, at the (present) four pct. rate, becomes twelve dollars per ton. That immediately poses a troublesome economic problem because the average proceeds per ton, from the sale of finished steel at prevailing prices, cannot absorb such a high depreciation charge.

"Either the addition of very high-cost facilities must be kept within reasonable economic proportions, or higher prices must be secured for the products made and sold. Higher prices, in our present economic situation, do not constitute a preferred or desirable method of procedure if they can be avoided.

"Even in the case of steel, which by comparison with other commodities is surprisingly low in price, attempts are being made to recede from the levels attained during the past year. As to the relative position of steel prices, it is pertinent to recall that during the period 1940 to 1947 inclusive, the wholesale price of all commodities in the aggregate, according to the Bureau of Labor Statistics, rose 108 pct., while the average price of steel, based upon commercial records increased by about 46 pct.

"So the statement that steel prices are surprisingly low is readily defensible. Even so, it is hardly possible that the group of advocates who have been urging publicly that the steel industry proceed forthwith to expand by another ten million tons beyond its already notable increase in capacity, would be the first to defend or condone the higher prices necessary to defray the added cost imposed by the inordinately expensive new equipment."

Alcoa Plans a 2-Potline Plant for Gulf Coast

Port Lavaca, Tex.

• • • **Aluminum Co.** of America has announced plans for erection of an aluminum-producing plant at Point Comfort, near Port Lavaca, Texas. The new plant will use natural gas for the generation of the large amounts of electric power required for aluminum production. The plant site is on Matagorda Bay, in the area between Houston and

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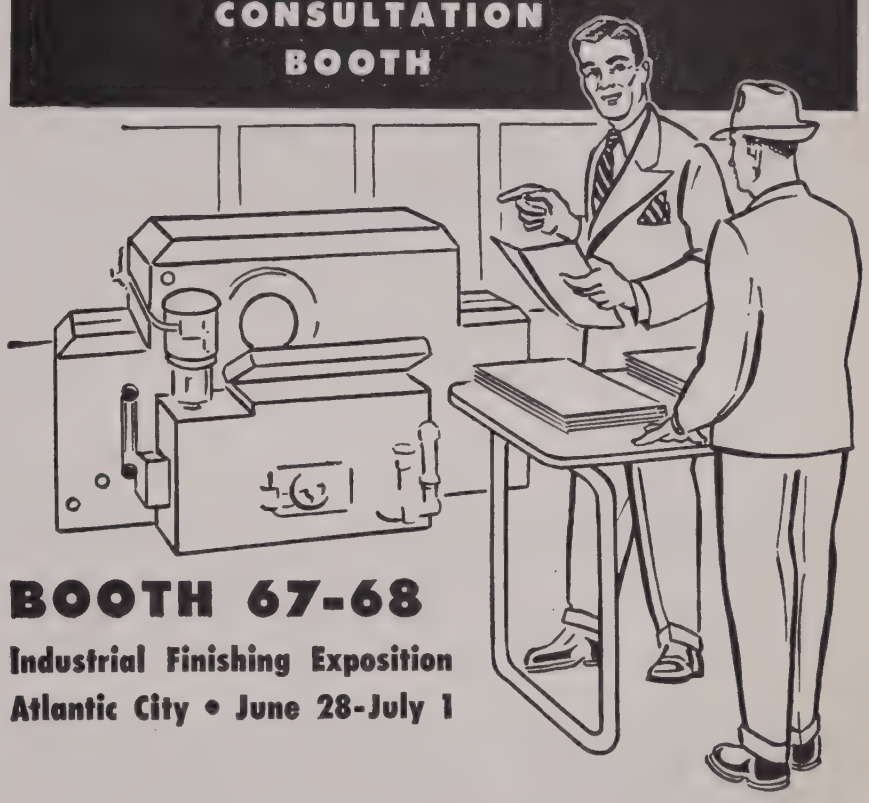

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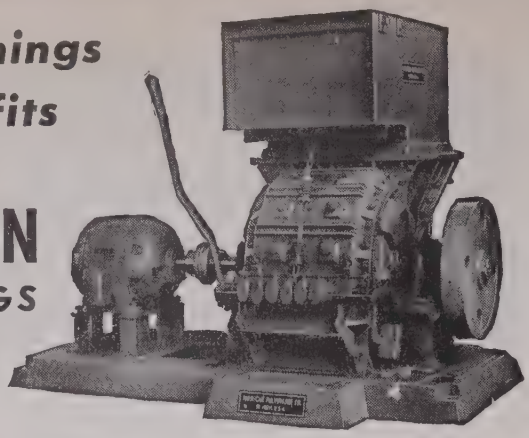

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Corpus Christi, and comprises over 3000 acres of land.

Present plans indicate that the project will be completed in about 2 years, according to I. W. Wilson, Alcoa's vice-president in charge of operations, and Thomas D. Jolly, vice-president and chief engineer for the company. Between 400 and 500 persons will be employed when full-scale operations get under way, they stated.

Alcoa installations at Point Comfort will include: two potlines for reduction of alumina and a plant to make the carbon electrodes required in the electrolytic aluminum producing process.

The electric generating equipment to be installed at the project will have an 80,000-kw installed capacity, the Alcoa officials said

Railroads Now Return Ton of Scrap For Each 2 Tons of Steel Received

Washington

• • • **More than a** ton of scrap metal for every two tons of iron and steel bought by the railroads during the past four years has been turned back to the iron and steel industry, according to the Association of American Railroads.

In 1947, railroads and railroad equipment builders obtained 6,029,000 tons of rolled steel which went into production of new freight and passenger cars, locomotives, repair and equipment and roadway and other purposes connected with railroad operation. At the same time, the railroads turned back to the iron and steel industry, including foundries, 3,818,000 net tons of scrap. Scrap returned by the railroads to the industry in 1946 amounted to 3,164,000 net tons compared with 4,764,000 net tons of rolled steel received.

In addition, the railroads salvage and reclaim each year approximately 1,000,000 tons of worn-out and obsolete parts and materials which help in solving the difficult problem of distributing available steel among the many users dependent upon it.

Of the 29 million net tons of purchase scrap consumed by the iron and steel industry in 1947, railroads alone supplied 13.1 pct. In 1946 the industry consumed 23 million net tons of purchase scrap, of which 13.8 pct. came from the railroads.

As a result of Railroad Scrap Collection Week which took place April 5-10 this year, more than 286,000 net tons of scrap either were

collected by the railroads or will be made available as a direct result of the drive, according to reports received by the AAR. Because of weather conditions and other factors which forced certain railroads in the extreme Northern sections to delay their scrap drive, this figure is expected to be increased when final reports have been received.

Canadian Output Hits All-Time High During March; 95 Pct Capacity

Toronto

• • • **Canadian production** of steel ingots and castings in March made an all time high monthly record, totalling 286,026 net tons, or 94.9 pct of rated capacity, and compares with 239,646 tons for February when the rate was 82.6 pct, and with 269,732 tons for March 1947. For the month under review output included 275,349 tons of steel ingots and 10,677 tons of castings.

Charges to steel furnaces in March were 151,246 tons of pig iron, 83,082 tons of scrap of consumers own make and 79,273 tons of purchased scrap.

For the first 3 months this year production of steel ingots and castings totalled 782,398 net tons, compared with 748,752 tons for the 1947 quarter and 727,633 tons for 1946.

Canada's steel furnace capacity at the end of March 1948, totalled 3,547,000 net tons per annum, of which basic openhearth capacity for production of ingots was 2,770,000 tons; electric, 475,000 tons, or total ingot capacity of 3,245,000 tons, while steel castings capacity is rated at 302,000 net tons.

Following are comparative monthly production figures for 1947 in net tons.

	Steel Ingots	*Castings*
January	247,768	8,958
February ...	230,183	9,463
March	275,349	10,677
Total 3 Months, 1948	753,300	29,098

• • • **Canadian pig** iron production for March amounted to 172,675 net tons, or a daily average of 74 pct of total capacity, and compares with 151,123 tons for February when the rate was 69.3 pct, and with 164,403 tons for March 1947. For the month under review output included 141,929 tons of basic iron of which 138,424 tons were for further use of producers and 3515 tons for sale; 17,576 tons of foundry iron, with 2611 tons for further use

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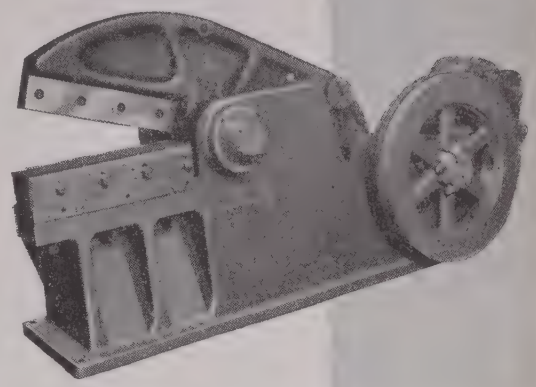

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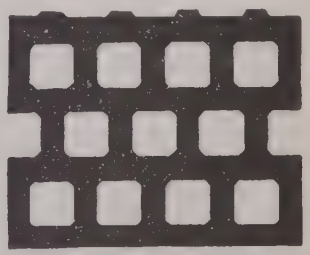

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and 14,965 tons for sale, and 13,160 tons of malleable iron, all for sale. During the month 11 of the 14 furnaces in Canada were in blast with three blown out.

Charges to blast furnaces in March included 329,453 tons of iron ore, 18,503 tons of mill cinder, scale, sinter, etc., and 6439 tons of scrap.

For the first 3 months this year pig iron output totalled 483,840 net tons, compared with 492,348 tons for the 1947 period and 327,945 tons for 1946.

Sees Design Changes Boosting Flying Range of Jet-Powered Planes

New York

• • • **Design changes** that are making possible substantial reduction in jet engine fuel consumption rates will enable long-range planes of the future to fly on jet power, R. P. Kroon, manager of engineering for the Westinghouse Aviation Gas Turbine Div. at Philadelphia, said here recently.

Recent laboratory and operational achievements, he said, are reversing earlier engineering thinking which held that jets' fuel consumption would preclude their usefulness except for relatively short-range work.

"The traditionally high fuel consumption of jet engines is already down 30 pct. from that of engines built 3 and 4 years ago," Mr. Kroon told a convention meeting of the Aviation Writers Assn. Another drop of 20 pct. in the next few years seems likely, he added.

"Because percentage of fuel saving can be translated directly into additional flying range—disregarding improvements in engine weight and modifications of the airplane to yield greater distance—we can now foresee jet planes that will make the two-to-three-thousand-mile-ranges predicted a few years ago seem very old fashioned."

Progress in development of jet engines has been so rapid, in fact, Mr. Kroon said, that it has already speeded up military aircraft procurement timetables. Plane builders are now being asked to consider for new aircraft designs engines that will not be available for 1, 2 or even 4 years.

"In the past, when military technicians were confined to use of conventional reciprocating engines," he added, "they were limited largely to asking for planes that could use already-proven engines. Otherwise by the time a new engine has been developed to fill their needs, the plane might be approaching obsolescence."

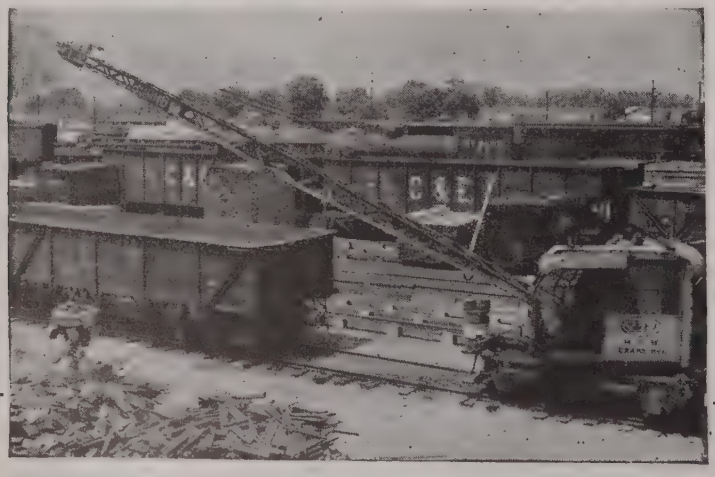
Mr. Kroon pointed out that design of the Navy's first jet-propelled fighter, the twin-engined McDonnell Phantom, was laid down at the same time design on the engines got under way in the Westinghouse turbine engineering offices. The Banshee, double-powered successor to the Phantom, followed the same schedule in relation to design of its engines.

As proof of the rate of development of jet engines, Mr. Kroon told the newspaper and magazine writers, "a Navy fighter pilot today can fly 30 pct. farther than he could with engines of the same size 4 years ago. Besides being able merely to take a plane farther from its base, this same basic engine can fly four times as high as its prototype, run three times as long before needing overhauling, and stand up under stresses of heat cold, speed and maneuvering that were scarcely even visualized when its design was first conceived.

"Although there is obviously a practical limit to the amount of performance that can be achieved from a given engine size, experience to date has shown that we can expect an average rate of improvement amounting to about five per cent a year in terms of the job the engine must do.

"The greater performance capabilities of the latest version of this engine model," the engineer said "is due basically to a model-by-model reduction in weight per pound of thrust and in rate of fuel consumption. In five years and eight models of this 19-inch engine specific weight has dropped more than one-third, power has increased 42 pct., and specific fuel consumption has been chopped 18 pct."

"Such larger engine sizes as the J34 which powers the Banshee, and the new XF-85 'Parasite' Air Force fighter, which have had more intensive engineering attention have shown even more impressive gains in the crucial matters of specific weight and specific fuel consumption, the two most important qualities of engine performance," Mr. Kroon said. "Here weight has been shaved more than 40 pct. and



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iel consumption has been cut more han one-quarter as compared with ie rates for earlier and smaller ngines."

Beyond mere increase in size to et more absolute thrust, reduction n fuel consumption rate and increase in service life will continue o claim major attention from jet ngineers in the future, Mr. Kroon aid, adding:

"By far the most important single actor in the development of jet ower plants will be the reduction n the rate of fuel consumption for given amount of thrust.

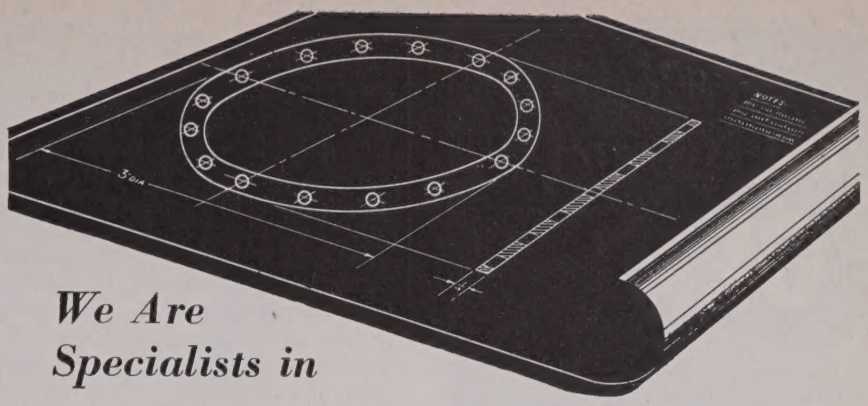
"As a rule of thumb, we can say hat in future long-range jet planes, he weight of the engines will be nly about one-fifth that of the fuel hey will burn. Hence a reduction n engine weight per pound of hrust of 25 pct.—a virtually impossible order—would be only as valuble as a 5 pct. drop in fuel rate, vhich is only a fraction of what we xpect eventually to attain.

"As we have seen, overhaul intervals on present engines have already been stretched to something ike three times the original periods, nd a jet engine can now take a lane as much as 75,000 miles between overhauls. This is about the alf-way point of what can now be xpected from reciprocating engine ypes, although the jets have been nder development for only eight r nine years, and reciprocating engines have had about half a cenury of refinement."

The very nature of jet-plane operation, the engineer explained, sets up a whole series of difficult engine requirements in addition to the continuous need for more thrust, onger life, and better fuel economy.

"Naturally, aircraft speeds are increasing—a direct result of the use of jet propulsion," Mr. Kroon explained. "But as speeds increase, the temperature and density of the air rammed into the engine also rises, and light alloy parts that were perfectly suitable for ordinary flight speeds must be replaced by steel—which adds weight.

"Modern engines must also devote hundreds of horsepower to auxiliary services such as generator drives and hydraulic pumps, and more hundreds of horsepower are diverted from production of thrust to provide the 'bleed air' for supercharging high-altitude cabins. Maneuvering loads, too—the G's an engine must endure in combat operation—have doubled in the past



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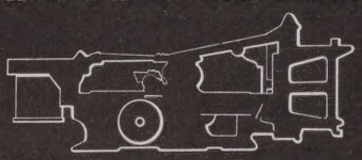

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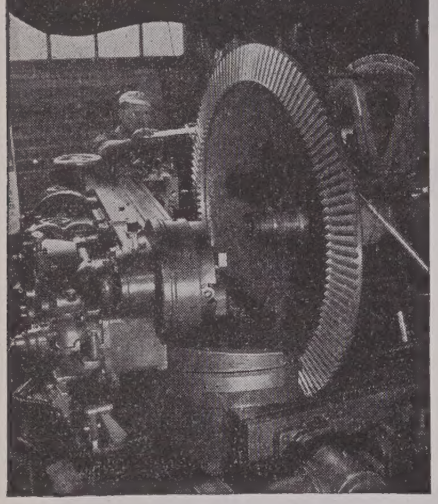

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two years alone, which also means addition of weight to provide needed stiffness.

"With the emphasis on global warfare, engines are also required to operate both in very cold and in very hot atmospheric conditions. Ultra-cold air, while an excellent means of augmenting thrust, entails operating problems with fuel pumps and lubrication systems; hot atmospheric air on the other hand demands more conservative design from the point of view of top turbine temperatures, and thus costs many pounds of thrust.

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Lead Industries Assn. Elects Felix Wormser

New York

• • • **At the annual** meeting of the Lead Industries Assn. Felix Edgar Wormser, vice-president, St. Joseph Lead Co., was elected president and chairman of the board, succeeding Clinton H. Crane.

J. A. Martino, president, National Lead Co., was elected vice-president and K. C. Brownell, executive vice-president of American Smelting & Refining Co., was re-elected vice-president. Robert L. Ziegfeld continues as secretary and treasurer.

New members of the executive committee are: Felix Wormser, chairman; J. A. Martino, George Mixter, vice-president, United States Smelting Refining & Mining Co. Inc.; K. C. Brownell and L. E. Hanley, president, Hecla Mining Co., were re-elected to the committee.

P. E. Sprague, vice-president, Glidden Co., was elected a new director at the meeting in addition to Messrs. Martino, Mixter and Wormser. Other directors who were re-elected are:

Norman Hickman, vice-president, American Metal Co., Ltd.; K. C. Brownell, executive vice-president, American Smelting & Refining Co.; Clarence Glass, vice-president, Anaconda Sales Co.; S. A. Easton, president, Bunker Hill & Sullivan Mining & Concentrating Co.; A. E. Bendelari, director, Eagle-Picher Co.; J. H. Schaefer, vice-president, Ethyl Corp.; E. L. Newhouse, Jr., president, Federated Metals Division, American Smelting & Refining Co.; L. E. Hanley, president, Hecla Mining Co.; O. N. Friend, vice-president, Park Utah Consolidated Mines Co.; James Ivers, vice-president, Silver King Coalition Mines Co.; J. W. Wade, president, Tintic Standard Mining Co.

Steel Exports Drop 14 Pct For Second Consecutive Mon

Washington

• • • **Iron and steel** exports semifinished and finished produ dropped about 14 pct in February 430,954 net tons, according to Co merce Dept. estimates.

February is the second consec tive month in which semifinish and finished exports declined in v ume. January exports totalled 50 767 net tons, while the Decemb tonnage was placed at 558,735 tons by the Commerce Dept.

Exports of semifinished and f ished products in February w (net tons):

Ingots, blooms, billets, slabs, sh bars, 27,677; wire rods, 4,129; ske 4,552; iron bars, 368; concrete re forcement bars, 11,243; steel ba cold finished, 5,239; other steel b (excluding alloy) 31,857; alloy st bars, 5,508; welding rods, elect 1,306; boiler plate, 3,217; oth plates, not fab, 32,326; plates, fa punched or shaped, 1,151; i sheets, black, 2,220; steel she black, 44,019; galvanized she 4,115; strip steel, cold rolled, 5,1 strip steel, hot rolled, 7,264; plate and tagger's tin, 54,407; te plate (incl. long ternes), 513; str tural shapes, plain, 28,946; str tural shapes, fab, 12,088; fra and sashes, 279; sheet piling, 4,1 rails, 60 lbs per yard and over, 3 287; rails, less than 60 lbs per ya 414; rails, relaying, 1,033; spl bars and tie plates, 6,750; frogs switches, 425; railroad spikes, 1,0 railroad bolts, nuts, and wash 598; car wheels, tires and ax 3,472; seamless black pipe, 1,5 seamless casing and oil line p 17,773; seamless boiler tubes, 3,0 welded black pipe, 6,701; wel galvanized pipe, 3,391; welded cas and oil line pipe, 23,206; wel boiler tubes, 69; other pipe fittings, 6,933; plain wire, 6,3 galvanized wire, 3,412; barbed w 3,661; woven wire fencing, 1,3 woven wire screen cloth, 488; w rope and strand, 1,452; wire n

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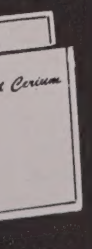

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1,781; other wire and manufactures, 3,595; horseshoe nails, 92; tacks, 348; other nails, incl. staples, 827; bolts, nuts, rivets and washers, except railroad, 5,039; forgings, 2,139; horseshoes, 7; total 430,954.

Vise Standards Are Out

Washington

• • • **Printed copies of** the Simplified Practice Recommendation for Vises are now available, according to the National Bureau of Standards. The recommendation is identified as R229-48, Vises (Machinists' and Related Kinds) and is effective from May 1, 1948.

This recommendation is based on the industry's experience with simplification during the war. It covers the following kinds of vises: Machinists', Combination Pipe, Filers' or Tool Makers', Sheet Metal Workers', Heavy Chipping, and Steam Fitters. A simplified list of sizes and types of the above kinds is established as a voluntary standard of practice.

Printed copies may be obtained from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., at ten cents each. A discount of 25 pct. is allowed on orders of 100 or more copies.

Rhodesian Ore Promising

London

• • • **Reference to the** Rhodesian pig-iron and ferro-chrome development plan from which John Brown & Co., Ltd., recently withdrew, was made by Mr. L. C. Walker, chairman, at the annual meeting of the Rhodesian Corporation in London. He said that at the time of John Brown's withdrawal, the estimated tonnages as a result of the prospecting work which had been carried out in Northern Rhodesia were 800 million tons of high grade iron ore, but stated to contain too high a silica content for satisfactory pig-iron production, and 40 million tons of high grade hematite ore.

Since that date further work had been done on the deposits and reports had now been received that contrary to initial reports a large proportion of the 800 million tons was low in silica, ranging from 2 pct to a maximum of under 7 pct. In addition further deposits of hematite had been discovered. Mr. Walker thought there was every reason to have confidence in the future of the projects.

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